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BRANCH I.

ORIGINAL COMMUNICATIONS.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Letter from WILLIAM DOUGLAS *esq. one of the Vice Presidents of the Agricultural Society of the Stewartry of Kirkcudbright.*

SIR,

THE success that has recently attended the culture of the Fiorin grass,—the reputation it has in consequence acquired,—and the expectations entertained of its extensive utility, having now made it an object of very general attention, the following communications regarding it may not be unacceptable to the majority of your readers, nor yet devoid of interest to agriculturists at large.

The Memoir, submitted by Mr Ainslie to the Agricultural Society of the Stewartry in 1811, and since printed at the Society's request, appears to have been the first publication that established, upon *evidence*, the undeniable value of the grass, and the first also, that, by removing the doubts of one of the most distinguished agriculturists of the present day, gave to the culture of Fiorin a rapid and general diffusion.

Dr Richardson himself, in his letter to the secretary of the Cork Institution, with that liberality which is always an attribute of superior mind, has borne the most ample testimony to the fact.—'Mr Curwen,' he observes, 'long doubted the truth

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'of the reports he received of the great value of this grass;—'he long opposed its introduction. At length an able and per-'spicuous paper, written and delivered in public by Mr Ainslie, 'carried conviction along with it. Ocular demonstration a-'lone was wanting; and that Mr Curwen sought and obtained 'from the magnificent Fiorin crops of General Dirom at Mount 'Annan.'—

'Mr Curwen,' he adds, 'instantly gave notice to me of his 'change of opinion, and his determination to take the first op-'portunity to disclaim all former errors, and strongly to re-'commend the cultivation of Fiorin. He persuaded me to be 'present at his manly avowal of former errors and change of 'opinion, and gave me, instead of an antagonist, the pleasant-'est and kindest acquaintance I ever formed.'

When Dr Richardson accompanied Mr Curwen on his visit to our Society in autumn 1811, he requested that a committee might be appointed to inspect his crops of Fiorin at Clonfeckle in Ireland. A committee was appointed:—Mr Boyd of Merton-hall, and Mr M'Culloch of Ardwall, with the most commend-able zeal, proceeded to Clonfeckle, and presented the Society, at their return, with a clear, full, and satisfactory report. This Re-port was followed, soon after it was printed, by a letter, also print-ed, from Dr Richardson to Mr Herries of Spottes, as preses of the Society's committee of management.

Though both Mr Herries and myself are there rallied by the Doctor with pleasantry and success on our *seeming* indifference, yet as the letter is, in some particulars, corrective of the Report, it cannot be, on that account, with propriety withheld.

I now therefore send, in their order, copies of Mr Ainslie's Memoir,—of Mr Boyd and Mr M'Culloch's Report,—and of the printed Letter of Dr Richardson which succeeded the Re-port.

Allow me to subjoin, that, if the perusal of these papers shall in any degree extend the culture of this truly valuable grass, the labour which those gentlemen have bestowed in effecting its introduction will be compensated, I am sure, in the way of all others the most consonant to their wishes, as well as the most gratifying and honourable to themselves.

I remain, Sir, your obedient servant,

WILLIAM DOUGLAS.

Castle Douglas, Jan. 1812.

Memoir

Memoir on the Fiorin Grass. By Mr Robert Ainslie, *Writer to the Signet. Read by him in the Agricultural Society of the Stewartry of Kirkcudbright, and published by their authority in April* 1811.

This grass has been lately brought forward into notice by the exertions of the Reverend Dr Richardson of Ireland. Since I purchased the estate of Edingham, in this stewartry, several communications have been made to the public on the subject; and it having appeared to me that there was land there which would suit the cultivation of it, I was induced to pay particular attention to it. This I was the more led to do from my connexion in business with General Sir James Stewart, of Coltness, a correspondent of Dr Richardson, and who had the goodness to furnish me with all the letters and papers in his possession regarding it. Sir James, as is probably known to many of the gentlemen here, is the son and representative of the eminent author on Political Economy, of the same name. He has all the public spirit and anxiety for the improvement of the country, worthy the son of such a father; and, having engaged keenly in the culture of this grass, had collected a good many tracts respecting it. The separate cultivation of this grass promises fair to be an improvement of the very first importance. It is therefore a proper subject for this Society; and having the opportunity of information, which I have just mentioned, it has occurred to me, that it would be acceptable to you, if I should read an essay regarding it. The order which I shall follow in it is, 1st, To describe the grass; 2dly, To state to you the very valuable qualities which it has been said to possess, with the proofs of its actually possessing them; and, lastly, To mention shortly what is considered as the most proper mode of its cultivation.

This grass is of that genus called Agrostis, and is named by Linnæus *Agrostis Stolonifera*, on account of the great quantity of stolones, or shootings, which it sends out. In Ireland, it has been denominated *fiorin*; but in this country, the vulgar appellation by which it has been known, has been the *creeping bent grass*. All our fields, particularly in moist situations, abound with it; though, from being generally cropped, or cut down, in that its natural state, it is seldom seen in perfection. The most remarkable thing respecting it is, that it puts forth a great profusion of lateral strings, which nature designs for its propagation, like the side-shootings by which strawberry-plants increase. Its root consists of a number of small fibres, not thicker than silk or linen threads, and not more than an inch,

or an inch and a half long,—penetrating into the earth but a very little way,—laying but a slender hold of the soil, and denoting altogether, that the grass draws more of its nourishment from the atmosphere, than from the ground on which it grows. And here I must mention that this grass has been, much to its prejudice, frequently confounded with the quicken, on account of a certain degree of resemblance. But the two are, in truth, most materially different from each other. The quicken is the most noxious of all weeds, on account of its lengthened tangling roots which exhaust the land; while its herbage is of the worst quality. The Fiorin grass, on the other hand, by its slender and simple root, does not injure the ground; while, as I shall show in the sequel, it affords the most nourishing food for horses, sheep, and cattle.

To point out the difference between the quicken and the fiorin, I have directed a parcel of each, including their roots, to be exhibited. They shall be laid before the Society, after I have finished reading this paper; and the distinction which I have mentioned will be clearly seen. This will rescue the Fiorin from a too common slander. Though, like the prisoner who was confined from his resemblance to a culprit, it may have suffered a temporary obloquy, the examination which you will give it, will restore to it the reputation which it merits.

The second matter to which I proposed to draw your attention, are the very valuable qualities which this grass is understood to possess. These are,

1st, That it grows luxuriantly in low and swampy grounds and mosses; which, but for the cultivation of it, would be of little or no value.

2dly, That it grows in very great quantities; the most favourable situations, which are irrigated meadows, having been known to produce above four times the weight of any single crop which is in general reared of any other grass.

3dly, That all horses, sheep, and cattle, are extremely fond of it; and actually prefer the hay which is made from it, to any other hay whatever.

4thly, That from the nature of this grass, and the length of time which it annually vegetates, it may be used with much advantage as green food, during the greatest part of the winter.

5thly, That it may be made into hay during winter, and whether the season is wet or dry.

These are its qualities; and some of them are, no doubt, extraordinary—indeed, so much so, that their existence has been doubted by many. This renders it necessary, that I should

should not only treat the matter somewhat more fully than would be requisite otherwise; but that I should lay before you the proofs which I can afford for establishing every one of these separate positions.

And here, addressing myself to this respectable Society, I think that I shall not have to combat a prejudice which is but too common in the beginning of improvements, namely, that what we are ignorant of, or is but imperfectly known, is supposed to have little merit; for it must be remembered, that it is in the order of nature, that we should owe to our own exertions and industry, the discovery and knowledge of whatever our Creator has made for us; and that there is no artificial grass, however much now in use, and even no grain, however common now, which was not, in some stage of society, just as little known as the fiorin grass has hitherto been.

While, however, I trust that we shall proceed thus liberally in our inquiries, we shall not be uncautious. And it has appeared to me, that it would lay a good foundation for our investigation into the qualities and advantages of the grass under separate culture, if we should learn *what* has been all along known of it, as composing part of the aggregate herbage of ordinary meadows; and what has been the opinion entertained of it as such by skilful agriculturists, before it had occurred to cultivate it as a separate crop at all. We shall, in fact, proceed here in the same way we should do in any matter of common life. Thus, suppose that a land-steward should offer his services to take sole charge of our farm; acknowledging, at the same time, that, as a manager, he had had but little experience; but stating that he could produce ample testimonials as to his character, when employed in the subordinate situation of one of a number of servants; would we not examine these certificates? And, if we found his character to have been uniformly good, when working as one of several, and in his lesser capacity, would not that prove an inducement to entrust him with a greater charge? To apply this simile to our present subject—suppose we found, that though never until of late separately cultivated, the Fiorin grass has been all along well known to botanists and scientific agriculturists, as one of the several descriptions of grass composing our finest meadows, and that their richness and verdure had been in no small degree ascribed to it; would not that form a strong presumption in its favour; and should not we be the more ready to consign a portion of our fields to it alone?

Before proceeding, therefore, to the evidence of the good qualities of this grass, under separate culture, we shall examine what has been known of it while cultivated along with other grasses,

grasses, and as forming only a part of our meadows; and I shall lay before you most ample and favourable certificates of its prior reputation.

The first authority which I shall refer to, is that of Dr Walker, our late very learned Professor of Natural History in the University of Edinburgh. His economical account of the Hebrides contains much general information on all such subjects as this. He there gives a list of such grasses as were ascertained to suit meadows best; and, among them, he mentions this grass, which he there styles *agrostis stolonifera*, or creeping bent grass; adding, (to use his own language), that, by 'means of 'these plants, many of our most watery meadows may be 'changed from a state of utter sterility, to become essentially 'beneficial; nor is any high degree of labour or expense ne-'cessary for the purpose.'—(See vol. I. p. 348.)

The Highland Society, some time ago, directed an examination to be made, and a report to be returned, regarding the water-meadows on the estates of the Duke of Buccleuch; and it became with me of importance to know, whether the Fiorin grass was a component part of those valuable fields. On searching the proceedings of the Society, I was happy to find, that it does make part of the grass of some of the best of them; and is one of those grasses to which the Reporter ascribes their fertility.—(See Highland Society's Transactions, vol. III. pp. 321, 322.)

The person who made this report was the Rev. Dr Singers, minister of Kirkpatrick-Juxta, a gentleman eminent for his knowledge of these subjects, who had, besides, favoured the Society with three several papers. The first of them is entitled, 'An Essay on the Grasses and other Native Plants most de-'serving of Culture in Scotland, for Hay or Pasture;' and he there gives a distinct list of such plants. In that list it is pleasing to find our Fiorin grass. He comments on the several descriptions of grass which he recommends; and, treating of the fiorin, or agrostis stolonifera, he says, 'it rises in moist lands.' He then classes it with another grass called agrostis alba; adding, '*Both these latter species frequently appear as component parts of our best meadow hay*, and are perennials.'

Another part of the same essay he entitles, 'On the most 'valuable combinations of our Native Plants in our hay-grounds 'or pasture-fields;' and he gives many instances of such combinations. He sets out with what he terms 'three combinations 'of good native plants from *watered meadows*, with specimens 'of *excellent hay*;' and of every one of these combinations the agrostis stolonifera, or fiorin grass, makes a part.—(See vol. III. p.

p. 163 of Transactions.) In his directions for laying down lands for water meadows, and giving a note of the grasses which he recommends, he expressly mentions this grass, which he calls *creeping bent.*—(See p. 186.) In his Essay on Irrigation, he gives a list of these grasses most fit to be cultivated on flat meadows; and he says, 'the genus of grasses called *agrostis-bent* furnishes two species, which are very good plants in watered meadows, viz. agrostis alba, and *agrostis stolonifera.*'

Mr Brown, Conductor of the Farmer's Magazine, writes the article *Agriculture* in the New Encyclopædia; and the treatise which he there furnishes, he has published as a separate work, called '*Of Rural Affairs.*' Under the title Irrigation, he there makes mention of this grass, as answering well in watered meadows. (See vol. II. p. 271.)

In the Agricultural Report of the county of Surrey, the author quotes a communication made to him by Mr Morris Birbeck of Wanborough, an intelligent and successful farmer of that county. Mr Birbeck, mentioning a piece of land which was speedily covered with turf by the natural grasses, states, 'that it was principally indebted to a single species, the *agrostis stolonifera* or black couch, a circumstance which I expected and wished for, the habits of this plant being *singularly adapted for water meadow*, which was my object; and I relied on it for the formation of a turf for the purpose of irrigation. I think it right to add, that the effect has exceeded my most sanguine expectations. Where the water has had its due effect, it would be difficult to distinguish it from *old meadow of very superior quality*, though it is only a year and a half since it was laid down.'

These are favourable accounts of this grass; but there still remains one more important. There is in Wiltshire a meadow, called the Orcheston meadow, which has been famous for centuries, on account of its excellent quality, and the immense quantity of its produce, as will be stated in the sequel. That meadow consists in a great degree of this grass; and the following quotation from Camden's Britannia will show, that it is there stated to do so entirely. 'The Wiltshire long grass meadows,' it is there said, 'are two acres and a half adjoining in Orcheston-parish, producing black couch, or couchy bent, agrostis stolonifera.' The author, after mentioning that it answers very ill in poor arable land and worn-out downs, where it is coarse and wiry, adds, 'that on the well-watered meadows, it is of a *juicy, nourishing quality*, as grass, and makes the *most desirable* hay for sheep. It is uniformly found,' says he, 'in meadows situated near the spring heads, and unequally watered, being almost the only grass common

'common to water-meadows that will stand *wet* or *dry*.' (See Camden's Britannia, vol. I. p. 138. *)

In addition to these authorities from books, I may add, I suppose, the experience of every person present, who, if he will examine his best natural meadows in moist situations, will find this grass abounding, and forming much of the nourishing food which his grounds of that description produce.

The accounts of this grass which I have now given from agricultural writers, bear ample testimony to its good character in the subordinate situations which, till of late, it has only been allowed to occupy. I come now to inquire, whether it has supported, and even enlarged its reputation, where greater trust has been reposed in it, and where whole fields have been consigned to it alone; and I am happy to say, that it has not only sustained its former character, but grown in respectability. Simile apart, however, it must be remembered, that Dr Richardson, and the other gentlemen who have followed him in his meritorious labours, pretend to no discovery of what is new: they merely show to what advantage this grass may be cultivated separately on lands otherwise of very little value, and what extent of produce may be obtained from it; and this is the subject of our second topic in this memoir.

Those authorities which I quoted from books, refer chiefly to this grass, as constituting part of the herbage of meadows properly so called. But, in an essay upon Peat by Dr Walker, in the Transactions of the Highland Society, he mentions it as a natural grass upon moss; and the following communication has been made me on the subject, by letter from Mr Patrick Neill,

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* The following note has been handed me by Dr Singers, with whom I have had the pleasure of becoming acquainted since reading this paper, viz. 'The celebrated Orcheston Meadows have all along been said to consist of the fiorin grass, *agrostis stolonifera*.

'Mr Don, in the Transactions of the Highland Society, asserted, on the authority of some botanical friend, that these meadows consist almost wholly of the common poa.

'The truth is, that early in the season the common poa rises into flower stalk; and if the meadows contain this valuable plant, it will then appear. But not a plant of the fiorin is then in flower stalk.

'On the contrary, at a late period of the season, the fiorin is all advanced into flower; and at this period the common poa, which is the earliest among our meadow grasses, is gone.

'The inference therefore must be, that the gentlemen who visited these famous meadows, had seen them at different periods of the season; and that they contain chiefly the common poa and fiorin intermixed.'

Neill, Secretary to the Caledonian Horticultural Society at Edinburgh. 'Last year,' says he, 'while on the island of 'Scalpa of Harris, one of the Western isles, the keeper of the 'lighthouse there, in digging his peats from a shallow moss, 'immediately incumbent on a rock, had been at considerable 'pains to leave a tolerably level surface. This surface I found, 'in many places, concealed by a *natural* covering of luxuriant 'fiorin strings; and the thin peat soil on which the fiorin was 'thus growing, was as miserable and poor as can be conceiv-'ed.' Dr Richardson, and those who have imitated him, have tried it, with the best effect, on mosses, which before were productive of almost nothing. Mr Miller of Dalswinton, who is ever ready to bring forward all improvements, sent Mr Farish (who takes charge of his rural affairs) to Ireland, to examine the operations which were there carried on in the rearing and cultivation of it by Dr Richardson. Mr Farish, on his return, published an account of them; and to his valuable pamphlet I must now refer you. Suffice it to say, that you will there see that Dr Richardson raised excellent crops of it on mere moss; and in a letter to Sir James Steuart, of so late a date as 5th March last, he wrote, 'I this day brought home 'excellent hay, mowed on the spot whence I cut my peats last 'summer, 1810.' Mr Miller has tried it with good effect on marshy land, which formerly produced but little; and Sir James Steuart has grown some of it on wet moss, and is now preparing moss to raise it on a much broader scale. The specimens of both of these gentlemen I have seen; but that of Sir James had been much injured by some voracious cows, who, allured by it, plunged into the moss, and ate up almost the whole of it; affording, thereby, better testimony in its favour, than the elaborate writings of all the learned professors and agriculturists of the whole nation could have done.

I have heard it objected to this grass, by those who were inclined to depreciate it, that they found it often in worn-out farms, and on poor land, meaning thereby to class it with weeds, and to say it was of little value; but this accords accurately with the account of it now given, that it grows on indifferent soil. And it is no bad account of a friend, whether animal or vegetable, that even our *poverty* does not produce a separation from us.

As to the quantity of the grass which may be raised on any given portion of land;—from the nature of it, and even without the aid of experience, we may conclude, that it must be great. For you will observe, that it is not merely the upright stems that are made use of in rearing produce from it, as in other grasses, but the lateral lengthened strings, which have been above described,

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are also resorted to; and as they are of considerable, and some of them of great length, and the number of them which the plant sends forth always large, the quantity of produce cannot fail to be very abundant. The name which in Ireland is given to the grass, of itself demonstrates this to be the case. The term *fiorin*, in the native Irish language, signifies *grassy*, or 'the plant eminent for the great quantity of grass which it 'bears;' * and all the certificates and affidavits which have been given and made respecting it, accordingly, show the great amount of its produce.

Thus, Patrick Gaw, land-steward to Dr Richardson, made affidavit to certain ground of his master's having produced seven tons four hundred and one quarter and eight pounds of hay the English acre; and added, that he had measured the plot, and weighed the produce, and that the hay was fully dry and merchantable by weight, between man and man.

After mentioning certain watered meadows of Dr Richardson, Mr Farish, in his pamphlet, says, that 'the Honourable Mr 'Corry, M. P. attended, and saw the crop from them fairly 'weighed, amounting to eight tons five hundred two quarters 'and twenty-four pounds, the English acre:' and this, with many other interesting facts, he adds, 'Mr Corry confirms, in 'a report under his own hand, which will be speedily publish-'ed.' In an appendix to the pamphlet, Mr Farish shows the amount of produce, according to that rate, on the Scots acre, to be no less than nine hundred and twenty-nine stones nineteen pounds; and adds, that at one shilling per stone, the produce, per Scots acre, would sell for no less than 46*l.* 7*s.* Sterling.

The late letter above quoted, which Sir James Steuart received from Dr Richardson, was an answer to one which he had written him, consulting him as to the best mode of cultivating two different fields of moss with this grass; and the Doctor, in that playful style which characterizes all his writings, answers—'You consult me on very different descriptions of 'ground, each of which I shall convert into better meadow than 'any in Britain. Do you think that I will be contented with 'the paltry crop which Dr Singers has viewed for the Duke of 'Buccleuch—a ton and a half, or, at a great stretch, two tons? 'If I *do not give you five or six tons of better hay* per acre, I 'shall be disgraced.'

But there still remains another very important fact on this part

* A gentleman, well acquainted with the Gaelic language, has favoured the Conductor with the following etymologies of this word. *Feorin*, from *feor*, or *fear*, grass, and *avin*, pronounced *ain*, the genitive case of *avon*, a river,—the river grass. *Fear roighin*, pronounced *roin*,—the choice grass.

part of our subject. In the former part of the Essay, I showed you, by a quotation from Camden's Britannia, that the famous Orcheston meadow, in Wiltshire in England, consists chiefly of this grass. A late publication has enabled me to mention the amount of the produce of that meadow. What I allude to is the first number of the British Review. That book gives an account of this grass, and of the different pamphlets which have treated of it. It is there said, that the tythe of that meadow, which consists only of two acres and a half, has been compounded with the parson of the parish for nine pounds sterling yearly. This would make the produce of it equal to 90*l.* per annum, or 36*l.* sterling per English acre, making the value, per Scots acre, equal to 43*l.* 8*s.* Sterling, which is not far distant from the amount mentioned by Mr Farish, as above stated.

These proofs, it is humbly thought, go sufficiently to establish the fact of the very great quantity of this grass which may be produced on any given portion of land.

The next quality of it which I shall advert to is, that all horses, cattle, and sheep, are remarkably fond of it. This has been again and again proven by many persons. To the letter of Doctor Richardson to Mr Corry above quoted, there are annexed the affidavits of three of his servants, made before James Vernor, Esq. one of his Majesty's Justices of Peace for the county of Tyrone; and the certificate of that respectable magistrate himself is also added, both bearing, that sheep, horses, and black cattle had, on repeated trials, preferred the fiorin to the common hay. As to the cattle, John Murphy particularly made oath, 'That, for several years, he had had the care of Dr 'Richardson's black cattle: that, last year, he was desired by his 'master to make experiments to try how his cows liked fiorin 'grass: that he repeatedly mowed it for them, and tried them 'with it, and other grass near it: that the cattle always prefer-'red the fiorin; and without tasting, but merely smelling, the 'other grass, turned to the fiorin.' The certificate of Mr Vernor, the justice of peace himself, was in these words—'I my-'self saw the same experiment tried upon horses, and with the 'same success. I also witnessed the *preference* given by Dr Rich-'ardson's sheep to the fiorin.'

The following certificate, to the same effect, was given under the hand of Lord Viscount Northland, and the reverend William Jones Armstrong, men of the first respectability:—'We 'carried some dry fiorin hay,' said they, 'from the field to the 'stable, and first offered Lord Northland's horses some common 'hay which they ate freely. They were then tried with the fiorin 'hay, which they seized greedily; and always afterwards *rejected* 'the

'the common hay when offered to them, looking about for the 'fiorin.'

Mr Farish says, at the conclusion of his work, that 'the 'predilection of every animal to this food is so decided, that 'they prefer it to any other. In the end of May last,' says he, 'I brought in a small sheaf from the field, which had stood 'uncut through the whole season, and appeared white and 'withered. This lay in the room of Mr Miller of Dalswinton 'for some days, which increased its dead appearance; Mr 'Miller then went to his stables, and caused the coachman to 'present a part of this sheaf, alongst with a parcel of fine sweet 'clover hay, to every horse, who not only ate the fiorin, with 'great relish, and sought with apparent eagerness for more 'when it was done, but refused the clover altogether.'

Mr Alexander Young, writer to the signet, who cultivates this grass successfully, wrote me, so late as the 4th curt. on this subject; and he there says,—'I have mentioned to several per-'sons, that I always found the green fiorin preferred to other 'food by horses and cattle; and this time twelve months, I tried 'it with my sheep, when they were lambing, and they ate it 'greedily.'

But, if all descriptions of beasts are so fond of this grass, it is fortunate that the nature and habits of it are such, as to enable them to be most conveniently fed with it, either as green food or hay.

This grass, if I may use the expression, is a winter as well as summer vegetable; and it continues to grow during the whole winter, as will be soon more clearly demonstrated. It may, therefore, in this respect, be well and conveniently used as green food; and, further, it has this advantage over turnip, that the milk, instead of receiving a disagreeable taste from it, continues sweet, and of good flavour. This appears from the following pleasant anecdote, told by Dr Richardson, in his letter to Lord Hertford:—'On December 22d,' says he, 'some young la-'dies, then living in my family, who took milk for supper, ob-'served, that it was remarkably rich, and well flavoured: We all 'tasted, and agreed in opinion. I, alone, knew that my cows 'had been put upon green fiorin three days before. The milk 'continued of the same quality through the winter, and was much 'enjoyed. In the month of March I went abroad for a week.—'On my return, the 22d, Mrs Richardson told me at supper, 'that the milk had lost its flavour; the fiorin, she supposed, 'growing old. I could not deny that the milk was much fallen 'off, and its richness gone; fearing, to my mortification, that 'Mrs Richardson had accounted for it. Next morning, however,

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'I inquired for the confidential labourer, who took care of my 'cows, and of my fiorin. I was told he had been absent five days 'sowing his oats.'—'Who cut fiorin for the cows?' I asked. —Answer, 'No one would venture in his absence and yours.' —'Matters were soon set to rights. The fiorin was restored to 'the cows, and the flavour to the milk, without any abatement, 'until the end of April, when the crop was expended.'

As to using fiorin for hay, there is one most remarkable quality which its strings have, that fit it for that purpose in an eminent degree. It is, that they retain their vegetable life for a very considerable time after being separated from the ground, preserving thereby their saccharine juice. Dr Richardson, in one of his publications, says, they will retain the power of vegetation for above four months after being cut. Wet weather, therefore, which is so prejudicial in the making of other hay, scarcely injures that made from fiorin; and of that fact I myself have been a witness. Sir John Sinclair, with that attention which he has always shown to every matter connected with improvement, cultivated a small plot of it, on the north side of the New Town of Edinburgh, last summer. It was cut early in the winter, but allowed to lye uncovered, and scarcely put into small cocks. It did not, however, rot as common hay would have done in that situation: but, for the greatest part of the winter, remained perfectly fresh; and, when offered to horses, as was frequently done in my sight, was eaten by them with the utmost relish.

This quality of the grass allows the hay to be made from it in the winter season: And, that it has been so made, Dr Richardson showed; for, in two different years (as is believed), he advertised, that he should mow his fiorin hay upon the 1st and 15th of every month, from the 15th October to the 15th February. He accordingly did so; and the whole neighbourhood, and even strangers from a distance, went and saw it, and examined the hay previously cut; and they were satisfied, not only of its excellent quality, but, notwithstanding the severity of the weather when it had been made, they found it in the best condition.

The last of the subjects of which I proposed to treat, was the mode of culture of fiorin. On this, however, I shall, of course, be extremely short, leaving the matter to more practical farmers than I am; and, for information, will refer you to a new edition of Mr Farish's pamphlet, which will soon be published. I shall only just mention, that much of what perplexed the agriculturists who have treated of this grass is now removed. They constantly stated the difficulty of obtaining a sufficient quantity of the

the seed of it for its production on large and extensive fields. But it is now found, that it is not by seed that it is chiefly to be cultivated; and that its strings are the means which nature has provided for that purpose. The method, therefore, of planting the grass, is by strewing those strings on land prepared for the purpose; and the slightest covering of mould will enable them to grow. I say the *slightest*; because experiments in propagating the grass have sometimes failed, by placing the covering too thick. Remember, that in scattering those strings, you are only imitating nature, which, in the wild state of the grass, would have sent them forth to grow without covering at all; and, therefore, all that is requisite, is merely what is sufficient to hold them to the soil. It is ascertained, that these strings will propagate the plant, though they are not recently, nor even lately, reaped, but taken from the hay-cock, which again arises from their valuable quality above-mentioned, of retaining vegetable life for a long time, even after they are removed from the ground. As to the season of planting it, that most approved of in practice, is about September or October. The reason of this is founded on another circumstance in its nature; namely, that the strings grow during winter, as I have already mentioned; and it becomes a matter of prudence with the farmer to place them in the ground when weeds are decayed, so that the young roots of the fiorin shall not be impeded by them. In short, a march is stolen upon the enemy, and a considerable progress is made while he is asleep. *

With regard to the preparation of the proper land for the reception of those strings, it has been understood that little is necessary; and there could be but little used on the land mentioned by Dr Richardson, in his letter to Sir James Stewart, above quoted, on which he cut his peats in summer, and grew the hay in winter, both within the space of less than one year. As has already been shown, the fiorin is a *natural* grass in the description of ground where it is recommended to cultivate it, namely, marshy lands and mosses. Such grounds very frequently send up most luxuriant herbage. Most of the plants rising from the soil in that uncultivated state, are no doubt useless; but if those were removed, and another natural and useful plant allowed sole possession, the vegetation and crops of it would be equally strong and abundant. Besides, the roots of the fiorin are extremely short and simple; and they enter but a very short way into the ground. They would seem, therefore, to admit but of slender aid from manure; and it has been found to answer well to use merely a little *compost* for keeping down the strings at the planting of the grass, in the manner above described. In the case of

* See further directions for planting it in the Postcript.

of paring and burning of moss, as a preparation for planting, that compost may be made conveniently by a mixture of the ashes arising from it. This notwithstanding, however, no doubt enriching the soil, must, in this, as in every other case, produce an enlarged crop. The following account is given by Dr Richardson, in his epitome of the qualities of this grass, as to his success on two several pieces of land, on one of which he grew fiorin without, and on the other with, manure. "A portion of ground," says he, "laid down with fiorin late in August 1806—twice mowed in 1807—and *not* manured, produced six tons the English acre in 1808; and a portion laid down, November 15, 1806—once mowed in 1807, and *tolerably manured*, produced in 1808, seven tons, four hundred, one quarter, and eight pounds, the English acre."

But amid all our recommendations, I am aware that it may naturally occur to ask,—What will the use of this grass accomplish in the feeding of stock? Now, to reason from some of its qualities above detailed, and before applying to experience, we ought to conclude, that it must be most serviceable in that respect; because, as I have demonstrated, all animals are fond of it; and the presumption is, that what they have so strong a relish for, has been designed for their food. Besides, as I have already said, from the nature of its strings, (of which its crops almost wholly consist), it retains its life and vegetable principle for a long time after being reaped. The saccharine juices of it, therefore, remain, and, of course, it long preserves a nourishing quality. In this respect, it is obvious, that hay made from it must be preferable to that from the other grasses; for the hay from them soon becomes perfectly hard, because the principle of life, and vegetable quality of the grass, had ceased the moment that it fell under the scythe. And it will be observed, that as the strings of the fiorin, with their joints, are intended by nature for the production of roots in the increase of the grass, they have a much greater quantity of fibre and substance in them, than there is in the composition of any other grass whatever; and therefore the produce of it must of course be much more nutritious. As to the actual experience which has been had of this grass in the way of feeding, so short a time has it been in separate culture, that there has been little opportunity for it, which, of course, must require considerable quantities of grass. An experiment, however, has been made, upon a limited scale, by Mr Miller of Dalswinton. He has fed seven sheep constantly upon fiorin since January last, with no other addition than that of about a pound of potatoes a day to each sheep, reckoning that seven-eighths of their nourishment has depended

on

on the fiorin grass. He has been killing them from time to time; and they are not only fat, but the mutton is excellent, and of the best taste and flavour.

I trust I have said enough to induce a fair trial of this grass. The days of prejudice are now long past: and let us not hesitate to take the advantage of what bountiful Nature appears so profusely to have thrown in our way. The time has been, when ignorance and stupidity prevailed in such matters to an extent which is now scarcely credible, as will appear from the following curious anecdote, which I shall pause to tell you.—When potatoes were first beginning to be known in the country, a clergyman in the west of Scotland grew in his field a much greater quantity of them than what were necessary for the use of his own family; having very little doubt but they must be eagerly sought after and purchased by the neighbourhood. He was, however, grievously mistaken—He forgot how ignorant and full of prejudice men then were: for he could sell none of them, even at any price. He next advertised, that the people might have them, merely for the raising them from the ground: But still he was disappointed; for none, even on such terms, would take the trouble to touch them. It had not, at that period, occurred to feed beasts of any description with them. And, at last, to clear his land, he was obliged to take them up himself; and, retaining them till they could not be used at all, he was actually forced to consign a large quantity, of what is now so well known to be a most excellent food, to the dunghill.

This, however, is a tale of other times—times of a description which will never return; and whatever impediments there may be in the way of improvements, it will never be the existence of such prejudices as these. I have only to say, that if the pains I have taken in my inquiries respecting this grass, and my preparation of this memoir regarding it, shall be found ultimately to have advanced, in any measure, an useful and valuable improvement, it will afford me much satisfaction. That specimens of the grass may be seen in the neighbourhood, I have caused plant a small plot of ground with it, on the east side of the new road at Edingham, and it will be shown by Mr James Shennan, my tenant there.

And here, before concluding, a question of very general importance, not in agriculture, but in political economy, presents itself for our consideration. Suppose that the Fiorin grass should be found to grow with as little cultivation, at as little expense, and yet as abundantly, on mosses and marshes as has been supposed, whereby an immense quantity of land would be brought

to valuable use, which has hitherto lain waste, what would be the consequence? Now, I humbly apprehend, that two beneficial effects would follow. 1st, That the use of animal food, and of course a nourishing diet, would be extended much more generally than it is at present to the lower orders of society; and, 2dly, That the population of the country would be greater than it would otherwise be. At first sight, it has occurred to some, that greatly increasing the number of cattle would overstock the market, thereby lower prices, and produce the ordinary evils of want of demand. But no such bad result would follow; because, though the prices were lowered, the market would not be overstocked, and both landlord and tenant would be saved from evil, by increased demand. Flesh meat would become cheaper; but more of it would be used, as the moderate rate at which it would be obtained would bring it within the reach of many, whose sustenance is at present vegetable food. The present case may be compared to the improvement of the manufactures. When cotton-mills were introduced, the quantity of muslin in the market was increased to a great extent, and the article became very cheap; but the manufacturers and merchants were nevertheless gainers; because the use of muslin became more general. Formerly, it was the dress only of ladies of rank and condition; but now it has descended to all the situations of life, and affords a pleasant clothing even to the lower orders of the people.

But it is not merely by increasing the quantity of animal food, that it appears to me the beneficial effects of the cultivation of this grass would be felt: For it is clear, it must also indirectly much enlarge the quantity of grain which the soil of the kingdom would produce. This it would do, by the production of a great quantity of manure; and the land hitherto waste, being applied to the feeding of cattle, would leave much ground for the rearing of corns, which was formerly employed for that purpose.

The other effect, which I said was likely to follow from this cultivation considerably extended, was an increase of the population, beyond what it would be without it. It is a well known principle, that a country will always people up to its resources; and when food increases, so will the numbers of the human race. Something of the kind appears peculiarly necessary now, that, by the banishment of the small-pox, through the introduction of the vaccine inoculation, population must soon be greatly enlarged, if there is a supply of food: and let us hope, as our children and future offspring are now saved from the ravages of that destructive distemper, that beneficent Providence

has, about the same time, brought forward this improvement as one among other means of supplying them with comfortable sustenance.

I shall now bring my paper to a close, trusting that I have shown, to the satisfaction of the gentlemen present, that this grass, even before it was separately cultivated, was all along well known as forming a valuable component part of our best meadows;—that since it has been cultivated separately, it has been found to answer on mosses, and other moist lands, formerly considered of little value;—that, even there, it is found to produce crops greatly more abundant than have ever been grown of any other grass on better soils; and that, in the most favourable situations of water meadows, the extent of the crops from it have amounted to no less than above four times what was almost ever raised of any other single crop of grass or hay whatever;—that this grass affords delicious food, prized, and greedily sought after, by all sheep, horses and black cattle; that the milk produced by cows fed upon it, is sweet and finely flavoured, different, in every respect, from that which is afforded by cows fed on turnip; that from certain qualities peculiar to this grass, it furnishes excellent green food during winter, and may be made into hay at the same season, with very little or no greater trouble; and, lastly, that, taking an enlarged view of the subject, there is every probability of its cultivation being attended with the most beneficial general consequences: If the Society shall be satisfied, as I am, on all these points, I am certain they will join with me in pronouncing the separate culture of this grass a most material and important improvement; and in holding the Reverend Dr Richardson, to whose genius, knowledge, and perseverance we owe it, as one of the greatest benefactors of his and our country.

POSTSCRIPT *to the foregoing Memoir.*

Since writing the foregoing Memoir, I have had a letter from a gentleman for whose judgment I have much respect, expressing considerable doubts that there may exist some mistake with regard to the great quantity of produce which this grass is said to afford, and which might proceed from two sources: 1st, From error in reckoning the different amounts compared together, by different acres, the Irish acre being much larger than that of England; and, 2dly, From comparing the *grass* of the fiorin with the *hay* from the summer grasses. This has led me to examine the matter a little more minutely than is done above, and the result is very satisfactory; it thence clearly

clearly appearing that there is no error in the case, but that the quantity of produce is actually as great as that mentioned in the foregoing paper.

The first source of mistake, it was said, might be with respect to the acre. Now, in answer to this, I have only to refer to the exact terms of the authorities above quoted regarding the quantities; in which it will be seen, that the English acre is mentioned,—a precaution which, I have no doubt, was taken for the purpose of avoiding the supposition of error on this point. Thus, in the deposition of Patrick Gaw, land-steward to Dr Richardson, while he states the ground therein specified to have produced seven tons four hundred and one quarter and eight pounds of hay, he expressly says, "per English acre." See his affidavit, annexed in a note to Dr Richardson's Letter to Mr Corry.

The great quantity stated by Mr Farish in his pamphlet, to have been grown on watered meadows, is also specified as measured by the English acre; and while Dr Richardson, as above quoted, mentions one field without manure having produced six tons, and another with manure having yielded seven tons four hundred one quarter and eight pounds per acre, he expressly specifies the *English* acre.

The other supposed ground of mistake was, that, in mentioning the great quantity of fiorin produce, the *grass* may have been meant, and not the *hay*; which, no doubt, would have been a most prolific source of error. But the truth is, there is no such mistake. For wherever the great amount of produce is mentioned, it is in general particularly marked, that the *hay* is meant; and it is frequently added, that it is *dry*. Thus, while Patrick Gaw, the land-steward, swore to the English acre having produced seven tons four hundred and one quarter and eight pounds of hay, he expressly added, that the "hay was fully dry, and merchantable, by weight, between man and man." And in looking into the epitome of the qualities of fiorin published by Dr Richardson above quoted, wherein he mentions the great quantities which grew on the two fields, the one with, and the other without manure, it will be found that he added, 'The hay of both parcels, when weighed, was *dry* and *rattling*; and, that it was in a *fair merchantable state* between man and man, was proved upon oath before the Earl of Gosford, in the presence of the owner and other credible witnesses.'

In Dr Richardson's Prize Essay, he says, 'A rood laid down on 15th November 1806, the field of my early experiments on fiorin, mentioned in the Transactions of the Belfast

'Literary Society, gave me at the rate of above seven tons of 'choice *dry hay* in 1808, and a pound more in 1809.'

In the following quotation from Dr Richardson's Essay on the Cultivation of Salt Marshes, he gives this view of the comparative quantity of fiorin and other hay crops. 'Two English 'noblemen,' says he, 'with whom I have the honour of cor-'responding, (and to whom for their aid I am under many ob-'ligations) ascertained for me the average crop of good mea-'dow in England to be two tons to the English acre.

'By the Transactions of the Highland Society, the average 'amount of the Duke of Buccleuch's watered meadows was un-'der one ton three fourths. Mr Curwen states an average 'crop of hay to be one ton and a half.

'Now, my upland Fiorin crops of 1808 were proved to 'be, one of them six tons, and another seven and nearly a 'quarter; while, in 1809, my friend the Right Honourable 'J. Corry ascertained in form, that one crop of irrigated mea-'dow exceeded eight tons and a quarter.'

On this quotation, it has been remarked, that the Doctor, in stating the weight of other hay crops than that of fiorin, says nothing of succeeding cuttings obtained in the same season, or of the value of the pasturage after the first crop, if only one is taken; nor does he say whether the quantities he mentions are meant to relate to one cutting only. But, after every fair allowance, the superiority of fiorin is evident; because the quantity of its crops is considerably greater than that of common hay, even with all these appendages. Besides (and what is of the greatest importance) the crops of fiorin, mentioned by the Doctor, have been raised in situations where other hay crops could not have been obtained at all.

As explanatory of the great quantities of fiorin produce, I may further add the account which Dr Richardson, in his Prize Essay, gives of the mode of its growth. When fiorin, he says, is placed in single plants, the strings, attaching themselves to the ground, send down roots from their several joints, whereby they increase; but after the ground has got completely covered with them, so that they cannot do so, and when, as he expresses it, the strings 'fall or lodge, then,' he adds, 'they emit little 'radicles from their joints, which, extracting nourishment from 'the damp fleece, encourage their growth, and enable those 'strings to attain length by their late vegetation.'

Should it be objected, that the fiorin hay is in general not so completely dry as that made from common grass, the fact may be admitted, without conceding any thing to the prejudice of fiorin; for it will be observed, that the small quantity of moisture which it

it may contain, is of a very different quality from that which might be found in ill dried common hay. Common hay can probably retain little other moisture than water, which would not fail to rot it. But it has been shown, in the foregoing Memoir, that the strings of the fiorin being full of joints intended for the production of roots, and themselves partaking in a great degree of the nature of roots, retain a saccharine juice of valuable quality. This juice, as has been shown, enables fiorin to resist putrefaction for a length of time; it preserves its vegetable life; and, instead of being the source of rottenness and destruction, which the wet in the ordinary hay cannot fail to be, it is apprehended that it must have the effect of saving it, even under unfavourable circumstances, for a long time. On this account, though it may be admitted that the weight of fiorin hay is composed partly of this saccharine juice, that is all in favour of it, when compared with common dry hay, because that juice must be of the most nourishing quality.

Since the foregoing Memoir was prepared, Mr Miller of Dalswinton has published a paper in the Dumfries newspapers, in November last, in which he gives a most favourable account of his own success in the cultivation of fiorin. He there mentions a peat bog near his house of Dalswinton, containing thirteen acres, from which peats had been dug many years. It was let for 15s. per acre, and, afterwards, taken into his own hands, and laid down with fiorin. After mentioning these things, he adds, 'I would not let it now, upon a lease of nineteen years, 'under 200*l.* a year; and if I should keep it, and take the labours and cares of the tenant on myself, I know I would make 'at least 300*l.* a year from it.' It is true, the laying down of this ground cost Mr Miller a very heavy expense; but that proceeded, in a great measure, from its requiring much levelling, owing to its having been formerly cut for peats, and because, as it would not carry horses, owing to its softness and moisture, it became necessary to work it with the spade. In that paper, he further gives the following instructions as to the time and mode of planting it. 'Fiorin,' says he, 'may 'be laid down in the months of September, October, and 'November. I begin with draining when requisite, as the 'ground should be made completely dry. If the ground to 'be laid down is ley, it should be summer-fallow; and all the 'stones, root-weeds, and other rubbish, carefully gathered 'and carried off. When the ground upon the surface is well 'pulverized, the grass may be scattered upon it. I sometimes lay it down, by sprinkling the strings uncut upon the 'surface; sometimes I employ women to twist the strings into loose ropes, about the thickness of the arm, which are

'cut

'cut by other women with a hedge-bill upon a plank, into 'lengths of three and a half inches; which cuttings I sprin-'kle upon the surface: At other times I sprinkle with those 'cuttings, and scatter whole strings over them. Although I 'use all these methods of laying down with this grass, and that 'I know all of them will answer well, I have not yet sufficient 'experience to say which is best. When this part of the work 'is done, the grass should be covered with a slight top-dress-'ing of lime and free earth well mixed and pulverized, or with 'peat-ashes and earth well mixed. The ground, if then dry, 'should be rolled with a wooden roller; and it must be com-'pletely and sufficiently enclosed, to keep out cattle and sheep. 'In laying down bogs and morasses, upon which horses can-'not go, the work must be done by the spade, and care taken, 'when trenching, to break the surface of it well. This is a 'very expensive way of laying down; but it will produce re-'turns to satisfy the cultivator. Holes and inequalities should 'be filled up. Stagnant water, though it will not kill the fio-'rin, yet it checks its growth, and discolours it; and such 'stagnant water should be taken off, by small cuts leading into 'main drains.' He adds, 'The ground laid down with fiorin 'the preceding year, should be carefully weeded by hand twice 'or thrice in the following summer months. This is done by 'women and girls, and, if carefully done, there will be no oc-'casion to weed again.'

To these minute and valuable directions of Mr Miller, I have only to add, that in the laying down of the grass, it is much recommended to do it *thick*; as, if it is thin, the first season is expended in the grass taking possession of the ground, and little or no crop, which can be used, is returned. Fiorin strings will be found in large quantities in almost all ditches where the water runs, and where the lands through which they pass are of good quality; and they are also very generally got under trees. The season at which it is recommended to gather them, is after harvest; and this time is preferred, because the fiorin is then in great luxuriance, and the season is past of some other of the summer grasses, as the *poa trivialis*, which, by having length-ened strings in favourable situations, are apt to be mistaken for it. Should it be wished rather to plant fiorin in the spring, Dr Richardson, in a letter to me, recommends that the strings should be gathered after harvest, and placed in a nursery during the winter, covered very slightly with earth or compost, to be ready for planting when spring arrives.

It will be remarked, that Mr Miller recommends that the land should be made completely dry. This refers to the time of planting; because, when the fiorin has got complete posses-

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sion of the ground, in all the specimens I have seen, I have uniformly observed, that it is most luxuriant in moist situations, providing that *stagnant* water is carefully avoided; and it seems universally acknowledged, that irrigation is of all things most favourable to it. *Edinburgh, January* 1812.

NOTE BY THE CONDUCTOR.

As this article has already occupied much more of our room than was at first assigned to it, the insertion of the Report of the Committee, and of Dr Richardson's observations on it, mentioned in Mr Douglas's letter, is necessarily postponed till next Number. Few or none of our readers, we trust, will think any apology necessary for the length of the Memoir and Postscript, when they have given them that attentive perusal to which they are entitled from the importance of the subject,—the spirit of candour and moderation in which it is treated,—and the facts adduced in support of the different statements. On the contrary, Mr Ainslie certainly deserves the thanks of every friend to agriculture, even though a difference of opinion may exist as to the degree of superiority which the Fiorin is alleged to possess in comparison with other hay crops. No man of a liberal mind, after observing the respectable authorities referred to, will venture to assert that the subject does not merit a thorough and impartial investigation.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Register of the Weather, from 1st January 1811 *to 1st January* 1812.

SIR,

THE following general monthly observations on the occurrences in the weather, from 1st January 1811 to 1st January 1812, are taken from a daily meteorological register kept in this county. Should you think it deserving of any notice, you will make what use of it you think proper.

JANUARY.—From the 1st to the 14th, the ground covered with snow, but of no great depth. From the 14th to the 28th, favourable weather for ploughing. From that date to the end, hard frost, with strong gales of wind. Ploughing suspended.

FEBRUARY.—From the 1st to the 7th, stormy weather, with frost and snow, which still suspended ploughing. From that date to the 12th, the weather more moderate, with fresh, but still inclining to be stormy. From the 12th to the 27th, frost with snow on the ground, which again stopped ploughing. At that date a thaw set in. On the 28th, ploughing again began,

gan; 29th, heavy rain, with snow. The month of February has been almost stormy and tempestuous throughout, with few intervals of mild and moderate weather. The whole time that ploughing could be carried on was about six days.

MARCH.—From the 1st to the 14th, stormy weather, with rain, and strong gales of wind. At that date began again to plough. From the 4th to the 14th, dry weather, when seed time commenced in this district. From the 14th to the 20th, weather still dry. The 20th and 21st rainy. From that date to the end, dry weather, with some frosty nights, succeeded by warm and sunshine days. Much seed sown in this month, and, excepting barley, the whole nearly finished.

APRIL.—From the 1st to the 7th, moderate and favourable weather. At that date, a fall of snow, with frost, which continued till the 12th. The 16th and 18th strong gales of wind, but without much rain. From the 21st to the 24th squally weather, with showers of rain. From that date to the end cloudy weather, with much rain and easterly harr. The month of April, upon the whole, may be considered as having been favourable for rural employment, and getting forward with the seed. Sowing of oats was nearly finished in this district about the 3d, and the greatest part of the barley about the 23d, under as favourable circumstances as perhaps could be wished for. The wheat not looking so well at this date as what was expected, particularly on thin clays with wet and cold bottoms; plants are thin, and many of them of a sickly colour. On dry soils the appearance is better.

MAY.—From the 1st to the 12th, in general cold weather, with much rain, the prevailing winds from the east; which kept back in some places the finishing of the barley seed, and in most places the planting of potatoes. At that date, much rain, with strong gales of wind, attended with thunder and lightning, which in some places did considerable damage. From the 12th to the 19th, weather more favourable for what yet remained of the barley seed, and planting potatoes. From the 19th to the 22d, cold weather, with frosty nights, the wind still at east. From the 22d to the end, variable, with rain and dry weather alternately, and upon the whole cold.

JUNE.—From the 1st to the 10th of this month, much rain, with strong gales of wind from the S. W., which retarded the sowing of turnips. From the 10th to the 16th, weather still cold and stormy, with frequent falls of rain. From the 16th to the 26th, dry weather, with cold winds from N. E. From 26th to the end, foggy nights inclining to frost, with warm sunshine days, the wind still continuing at N. E. The whole of this month, excepting a few days towards the end, may be considered

dered as having been unfriendly to vegetation; the corn on thin clays retaining much of that yellow and sickly colour which they had acquired during the late and cold weather, and will require much sun and genial weather to recover them previous to seeding.

The medium heat from 21st June 1810 to 21st June 1811, is about 64°. The greatest heat, 24th June, 78°; greatest cold, 29th January, 43°.

JULY.—From the 1st to the 14th, mostly dry weather, with the wind at N. E., inclining to be cold. The 14th stormy, with rain. From that date to the end, in general favourable weather for the hay harvest, which, in this district, began about the 12th, and finished about the end of the month under favourable circumstances.—The crop but a light one.

AUGUST.—The weather, for the greatest part of this month, has been of a variable nature, partly dry, with intervening showers of rain; but still has a tendency to be cold, with frequent gales of wind. On those farms, where the corn was in a state of forwardness, it is likely damage may have ensued; but, in this district, where the corn is still in an unripe state, little injury has been done. Reaping in a few places has begun; but the harvest cannot be general for some time to come.

SEPTEMBER.—From the 1st to the 21st of this month, dry weather with a warm sun. At this date, much corn in the lower district of this county cut down, and much of it no doubt in the stack-yard. Reaping in this district may be said to have become general about the 14th. On the 22d, a strong gale of wind; from that date to the end much rain, with few intervals of dry weather. The fields full of cut corn; little being taken in, in the higher districts, before the rainy weather began.

OCTOBER.—From the 1st to the 14th, few days without rain, at which date the greatest part of the corn still in the field. On the 13th, a gale of wind, which did considerable damage to the corn not then cut. From the 14th to the 26th, dry weather, when much corn was got in, and wheat sown. From 26th to the end, wet weather, with the wind at E. N. E. and S. E.

The number of dry days in this month was eleven; of wet days twenty.

NOVEMBER.—This month set in with stormy weather, high gales of wind, and rain, which continued with little intermisson till the 7th. From that date to the 16th, more moderate, the 15th excepted, which was stormy, with wind and rain. From the 16th to the end, fine and dry weather, and, excepting a few frosty nights, mild and fresh, which forwarded the labouring kept back by the wet weather which prevailed from the

26th

26th ultimo to the 16th instant. A considerable quantity of wheat at this period was likewise sown.

DECEMBER.—From the 1st to the 8th of this month, the weather stormy, with rain and wind; with some falls of snow, but of no great deepness. From the 8th to the 15th, the weather more settled, the nights inclining to frost, with dry and sunshine days. From 15th to 21st, changeable, frosty and fresh weather. From 21st to the end, frosty, and which stopped ploughing on the 26th. The 29th, a considerable fall of snow.

East Lothian, Higher District, 4th January 1812.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Use of Moss as a Manure to Land.

By WILLIAM AITON, *Strathaven.*

(Continued from No. 48, p. 467.)

SIR, *Strathaven, 22d February* 1812.

HAVING already submitted to your inspection an epitome of my enlarged Treatise on the Origin and Qualities of Moss, with the mode of forming it into a productive soil; and my communications on these subjects having been thought worthy of a place in the three last Numbers of your valuable Repository, I shall now implement my promise, by giving you an abridged account of what remains of my system, viz.

1. Directions how to convert moss into manure. And,
2. Mention a few instances of the most spirited improvements of moss soil that have been executed in different parts of Scotland and England.

Of Moss as Manure.

To descant, in such a work as the Farmer's Magazine, on the value of manure in husbandry, would be as absurd as to point out the utility of food to animals, or of light in the natural world. The adage, "*Muck is the mother of the meal chest,*" which is of unknown antiquity, shows that the value of one species of manure was properly understood in Scotland, even in the remotest ages. The utility of that article being still universally admitted, every method by which it can be augmented must be a matter of great interest in agriculture.

Manures are of two sorts, viz. those which communicate enriching or fertilizing qualities to the soil, such as dung, and every

every species of animal or vegetable matter; and those which act only as stimulants, decomposers and preparers of the real food of plants in the soil, as lime, marl, &c. It is to the first of these that I wish at present to direct your attention.

It has been shown, in former papers on this subject, that the plants which contribute to the formation of moss-earth, from the low temperature and degree of moisture in which they grow, or from the innate qualities of the plants, abound with acid, tannin, extract, and other ingredients that retard the progress of putrefaction, and prevent that powerful destroyer from reducing completely their original texture. It has been shown, that it is owing to these insoluble qualities in moss-plants, and the want of richer and more succulent ingredients, that moss-earth has ever been formed over the original soil.

It is these very qualities that prevent moss-earth from spontaneously becoming manure, the same as hay, straw, grass, or any other vegetable. Moss is wholly composed of vegetable matter—the successive crops of plants that have grown on the surface; and if that matter did not possess qualities different from those which form other vegetables, it would be as good manure as they are. Could moss-earth be only divested of its insoluble qualities, the whole mosses would form so many immense dunghills.

But what nature hath not accomplished, may be, at least in part, effected by the ingenuity and industry of man. Moss-earth is no doubt insoluble; but if that insolubility can be overcome by art, the end in view will be attained. The proper investigation can only be made by those who are conversant in science. My knowledge in chemistry is too imperfect to enable me to make correct experiments; nor have I had leisure even to make the attempt. The subject, however, has fallen under the investigation of others much better qualified to do it justice; and I trust means will soon be discovered of reducing the antiseptic qualities of moss-earth, and thereby setting at liberty the immense masses of vegetable food which now lye dormant in that species of earth. The inquiry is of high importance; and, as many of the most eminent chemists have begun to pay that attention to it which it so justly merits, more important discoveries may soon be expected. I know no discovery of the last century of nearly so much consequence. Could that great end be accomplished at a moderate expense, the fertility of the soil, all over Scotland, would exceed our most sanguine expectations. The deserts would become fruitful fields, in the utmost sense of the term; and subsistence might be raised in our native country for four times the present number

ber of its inhabitants. Till further discoveries are made, it is proper to attend to what is already known and practised on that subject. Moss-earth has been used as a manure with success, without any admixture or preparation whatever; it has been rendered in some measure soluble by being mixed with lime; and this has been more completely effected by bringing it under decomposition with dung and other fermenting substances.

Of Moss alone as Manure.

Moss-earth will, without any preparation whatever, operate as a manure to any other soil, in the same way that one sterile earth tends to enrich another. Moss-earth will help to mend the mechanical arrangement of any of the other soils; which is frequently their greatest defect. The extreme cohesiveness of clay is often a bar to its improvement: pure sand is unproductive from a contrary cause. If these are mixed with each other, or if moss-earth is mixed with either, they will be cured of these defects. The tenacious clay will be rendered more open; the moisture will more easily percolate; a greater scope will be given to the roots of plants; the clay will not be so retentive of moisture in wet weather, nor so adhesive when dry.

A mixture of moss among sand would deepen the soil, render it more retentive of moisture, and prevent the crop from being so readily injured by the drought.

If the clay lay in an elevated situation, and was extremely sterile and moist, moss-earth, in its natural state, would only form a mixture as soil; but the heat and fermentation under such circumstances would not be sufficient to accelerate its decomposition. But if mixed with a sandy or gravelly soil in a low situation, the moss-earth would have more powerful effects. It would not only mend the mechanical arrangement of the soil, but the heat of the sand, and more free access to air, would greatly accelerate the putrefaction and decomposition of moss-earth; and, as putrefaction proceeded, the food of vegetation would be supplied. But it is much better to bring the moss into a course of putridity by some fermenting admixture before it is applied to any soil. If no such mixture can be procured, let the moss-earth be thrown up in heaps, first exposed to the frost, and then to the other changes of weather for a year or two; and if it is turned over, some sand or clay mixed with it, and the whole exposed for two seasons to the weather, it will form a tolerable manure. But, in an age so enlightened as the present, it might well be expected that some more powerful dissolvent of moss-earth might be discovered.

Of

Of Moss formed into Manure by being mixed with Lime.

If moss-earth is minutely mixed with newly slacked lime, in a powdery state, and laid up in a midden for a few months, and once or twice turned over, well broken, and a small quantity of new lime thrown in when turned over, the antiseptic qualities of the moss, in the course of a year or so after being so mixed, will be overcome, and the moss brought into a state of rapid decomposition, and thereby formed into as good manure as so much straw, or other vegetables, that had been taken from the arable lands.

The best way to prepare it with lime is, to dig up the moss, and throw it into heaps after harvest, or early in winter, so that the frost may operate on the moss, and in part reduce its texture, before the drought forms it into peat. When dug up and exposed to summer drought, before the frost has loosened its adhesion, it becomes a real peat, and will not be again so easily broken down by the weather: But if it is exposed first to frost, the alternate changes of weather will soon reduce it from peat to earth:—the drought, after the frost, will not form it into peat; but, with the other changes of weather, it will aid in reducing the organic texture of the moss.

After being exposed to the weather for a whole winter, the moss earth may be removed in the spring to the field to which it is intended to be applied, and, when it is between wet and dry, thrown up into a convenient midden, and mixed with about a fifth or sixth part of its weight of hot newly slacked lime, in a powdery state. The moss should be as much broken as possible, and minutely mixed with the lime.

Lord Dundonald in his Treatise on the Connexion between Chemistry and Agriculture, observes (p. 109), that when the newly calcined lime, or what is usually termed lime shells, are mixed, unslacked, with the moss, the heat is so much increased as to reduce the moss to charcoal or cinder, and to dissipate its component parts into a gaseous state, leaving nothing but the ashes or carbonaceous matter, and such a portion of the fixed air generated in the process, as is absorbed by the lime returning to the state of chalk. The moss ought not therefore to be mixed with lime in the state of shells.

'The object is best attained by mixing newly made and 'completely slacked lime, with about five or six times its weight 'of peat, which should be moderately humid, and not in a 'too dry state. In this case, the heat generated will be mode-'rate, and never sufficient to convert the peat into carbonace-'ous matter, or to throw off, in the state of fixable air, the 'acids therein contained. The gases thus generated will be in-

'flammable

'flammable and phlogisticated air, forming volatile alkali, 'which will combine as it is formed with the oxygenated part 'of the peat that remains unacted upon by the lime, applied 'for this especial purpose in a small proportion. By this mode 'of conducting the process, a soluble saline matter will be pro-'cured, consisting of phosphat and oxylat of ammonia, whose 'beneficial effects on vegetation have already been described.

'Inattention or ignorance of these important facts, has pro-'bably, in many cases, defeated the wishes of the farmer in 'the application of this preparation, which is particularly re-'commended as a top-dressing to the grounds under pasture. 'The proportion of lime to peat here given, should be care-'fully attended to; and the mixing of the two substances to-'gether should be performed under cover, in a shed or out-house 'constructed for that purpose; as too much rain, or a too great 'exposure to air, will prevent a due action of the lime upon 'the peat. The success of most operations, but more especial-'ly of those of a chemical nature, greatly depends upon a re-'gular and due observance of circumstances apparently tri-'vial.

'This preparation of lime and peat, is in a peculiar manner 'conducive to the growth of clover, and of the short, and, 'as they are called, sweet kinds of pasture grasses. The soil 'also, by the application of it, acquires such a predisposing 'tendency to promote the growth of such grasses, as to pre-'vent its growing afterwards rank, coarse, or sour herbage.'

The compost of moss-earth thus made up with lime, ought to remain several months in that state; after which it ought to be turned over, well mixed and broken; some fresh lime, and if possible, a small quantity of earth, or even some little dung applied; and having remained a few months more in the midden, it may be used as manure, either as a top-dressing or otherwise. It should remain a year at least in the midden with the lime; but the longer it remains in that state, the oftener it is turned over, and the more lime, earth, dung, or other admixtures that are applied, the richer will be the manure. Whenever green herbage of any kind can be obtained, it ought to be mixed in the midden when turned over.

But the utility of moss-earth mixed with lime for manure has been doubted by some who, I should have supposed, were well qualified to judge of its value. A learned Senator of the College of Justice, Lord Meadowbank, whose researches in chemistry and agriculture have been unremitting, in an Essay published in the second volume of the Transactions of the Highland Society, page 150, says, 'Peat prepared with lime alone, 'has

'has not been found to answer as a good manure. In one instance, viz. in a bit of fallow sown with wheat, it was evidently pernicious.'

Dr Walker, in the Essay formerly mentioned, seems to doubt of the utility of moss as a manure, when prepared with lime. He says, (p. 55), 'When lime or any other calcareous 'manures are intermixed with peat, they may, by encountering the acid in the peat, occasion effervescence, by which the 'substance of the peat may be more minutely divided, and 'impregnated with neutralized and fertilizing matter. But 'these manures, though capable of effervescence, are themselves incapable of putrefaction, or of communicating that 'process to peat, or any other substance that is not susceptible 'of it. Accordingly, peat-earth, and lime both in its mild 'and caustic state, were mixed in various proportions; some 'of these mixtures were exposed to the air for one, and others 'for two years, yet no degree of putrefaction on the earth could 'be discerned; for though peat consists chiefly of vegetable 'matter, yet it is in such a state as to resist the septic powers 'of lime.'

When gentlemen so eminent in science, and so much conversant in agriculture, as the learned Judge and respectable Professor, have already decided, it may appear presumptuous in me, confessedly ignorant of chemistry, to offer my opinion. But with all deference to the memory of the one, and the high respect I entertain for the other, I am bound to say that both of them seem to me to have mistaken the effects of lime and moss-earth as manure. That it may fail in some instances, cannot be doubted. The cause of failure in the instance recorded by his Lordship, I shall not attempt to explain. But that it has been used with effect in many hundreds of instances, I have seen and known, both before and since I published on that subject; and that it still continues to be so used, by many who have had long experience of its effects as a manure, are facts which I know, and can well attest. Having seen the opinions of these respectable and intelligent authors on that subject, I have, in the course of my extensive peregrinations in Scotland and England, made particular inquiry into that matter, and I find that moss-earth, prepared with lime alone, has been used, and continues to be used, as a manure, with success, in many parts of both kingdoms. I would be cautious of receiving the stories of country people, in contradiction to well known principles of science. But, in a matter of this kind, I am disposed to give credit to the well attested facts of many who have made the experiment, though some men of extensive erudition may think

these

these experiments inconsistent with some of the general principles of science.

Lord Meadowbank does not indeed advance any argument founded on science against mixing lime with moss; but only says, moss so prepared was not found to be a good manure, and in one instance it proved injurious. But this might proceed from some peculiar quality in the soil, or some local or relative circumstances not attended to.

Dr Walker, indeed, opposes both theory and practice to the use of moss prepared with lime for manure; but it remains to be inquired into, whether he is correct in his theories and experiments. He admits, in the passage quoted, that when peat is mixed with lime, the calcareous matter encounters the acid in the peat; occasions effervescence, which divides the substance of the peat, and impregnates it with neutralized and fertilizing matter. Here the Professor not only admits the very fact I wish to establish, but explains the scientific process by which moss mixed with lime is formed into manure. But then he adds, that this species of manure is incapable of putrefaction, or of communicating that process to *subjects incapable of fermentation*; and says, moss is in such a state as to resist the septic powers of lime;—if so, it can do no good as manure; for it is only as putrefaction advances, that the food of plants is formed, or set at liberty from dead vegetable matter.

It may seem to be bold for me to presume to dispute the opinions of the respectable and intelligent Professor of Natural History. But every one who has paid the least attention to these matters knows, that, when hot lime, or any calcareous manure is mixed with moss, or any substance abounding with acid, the alkali in the lime encounters the acid in the moss, raises heat, fermentation and effervescence, which destroy both the alkali and the acid; neither of which are favourable to the growth of plants, and forms them into a neutral salt, which is propitious to their growth. By the acid being destroyed or neutralized, the antiseptic quality of the moss is removed, the fibre, and texture of the moss-earth broken, and it is thereby brought into a state of solubility, and converted into manure. The whole mass of moss-earth is entirely composed of vegetable matter that had grown on the surface, and is suspended, by its antiseptic quality, from complete dissolution. But the moment that antiseptic and insoluble quality is overcome, the whole body of moss earth is as fit for manure as so much hay, straw, or grass. The charm of insolubility once broken, and putrefaction begun, it will continue its course till every particle of the moss is reduced; and, as it advances, the food of plants will be

formed, and yielded up to the soil. Dr Walker himself admits the powers of calcareous earths, in promoting the putrefaction of vegetable substances. He says, in his Prize Essay, p. 24, 'Calcareous earth is well known to promote the putrefaction of 'vegetable and animal substances. The Island of Lismore is, 'for the most part, composed of limestone;—all its mosses are 'much intermixed with calcareous earth;—they are therefore 'most putrid, and most consumed of any that are to be seen.' The same effects will follow every where; and if moss be rendered sufficiently putrid, it will prove the best of manure.

That caustic lime will operate upon moss, in every state in which we find it, is evident from the effects it has upon other soils. When land has been often manured with dung, part of the vegetable matter, both of the dung, and that in the soil, becomes insoluble, and yields no food for vegetation. Hence we often find abundance of vegetable matter in the soil reduced entirely to earth; yet so insoluble as to be of no manner of use to vegetation. What is the remedy in this case?—Hot lime most undoubtedly. The caustic lime, when applied to land in that state, reduces the insolubility of the vegetable substance, and forces its dormant powers into action. In this case, the putrefaction of the vegetable matter has proceeded much farther than it has done on moss. Nothing of the vegetable fibre or texture of the plant remains; nor is even a black unmixed earth to be found there, as in moss. Nothing remains of the vegetable substance that is perceptible to the eye; yet enough will be found of the insoluble vegetable matter for the caustic lime to act upon. And such are the powers of hot lime, in reducing even these imperceptible remains of vegetable substances, that the most luxuriant crops of grain are always produced when hot lime is applied to such a soil. It would be strange, indeed, if lime, in a caustic state, had such powerful effects on vegetable matter, so far advanced in putrefaction, and yet had no such powers upon moss where putrefaction had not made such progress. If it were admitted, that hot lime had no such effects on moss, the reason must be very different from that assigned by Dr Walker: But, fortunately for mankind, he is not correct in that opinion.

Besides the Earl of Dundonald, I might also have quoted, on this subject, Dr Garnet and others, the best qualified to judge on scientific principles. The intelligent Mr Naismith (p. 43) says,—'We know, in general, that it is the property of quick 'lime to decompose most vegetable substances; and I am cer-'tain, from experience, that one part of lime newly slacked 'into a mild powder, mixed with five or six parts of moist

'peat, and the whole repeatedly turned and broken, before 'the lime becomes effete, falls into a fine friable mould; and 'that this mould, applied to any other soil, greatly promotes 'fertility.'

I might have noticed the error into which Dr Walker has fallen, in admitting, as he does, the powers of lime to neutralize the acid in moss, and minutely divide its parts, and yet doubting its powers of promoting putrefaction, even when exposed to the open air for one or two years. I can say, that I never saw moss-earth taken from the common mass, and laid out and exposed to the open air for two years, even when no admixture whatever was applied, but I found putrefaction had made considerable advances. When lime, or any caustic substance which acts powerfully in dissolving moist vegetable matter, is applied, the progress of putrefaction must be greatly accelerated.

Though I cannot help being diffident when I differ from Gentlemen so eminently qualified to judge, and would wish to treat their opinions with all manner of respect; yet, in the present case, I am fully satisfied in my own mind, that moss-earth, in general, may be converted into efficient manure by an admixture of lime. That opinion is founded upon the little knowledge I possess of science; it is corroborated by the concurring opinion of others more conversant in science than I can pretend to be; and it is confirmed by an experience of more than thirty years, under my own observation, as well as that of hundreds of others whom I could point out, who have, for several years past, used it with such success, as to induce them to continue the practice; and who are convinced, from well tried experience, that moss mixed with lime is highly beneficial as manure.

[To be continued.]

On a new Mode of Cultivating White Crops. By the Reverend Mr Campbell, *Kilcalmonell.*

[An account of a new method of cultivating White Crops, by Mr Campbell, was given in Vol. XII. p. 27; and that Gentleman has obligingly communicated a detail of his further experiments. We regret that our limits do not permit us to insert the whole of his communications; but, by his permission, so much of them shall now be presented as may enable our readers to make similar experiments. The result, experienced by Mr Campbell, is greatly in favour of his hoed ridges, both in crops 1810 and 1811. In the former year, they are stated to have produced at the rate of two bolls, four pecks

pecks and one lippie, per acre, more than was raised upon land of the same quality sown broadcast; and the account of his experiments, in the latter year, is given in his own words. Instead of marking off the line of the ridges upon the level surface, depositing the seed, and then raising the ridges to cover it, Mr Campbell now very properly forms his ridges first, exactly as if intended for potatoes or turnips; and they are afterwards flattened by a light harrow. A breadth of 6 or 12 inches, or any intermediate space on the middle of each, is then sown, which may be done by a machine similar to the turnip drill-barrow, and constructed so as to sow two or more ridges at once, by which there must be a considerable saving of seed and labour. The double mouldboard plough, by passing between the ridges, throws over the seed the earth drawn into the intervals by the harrow. The ridges are then rolled, and receive the same horse-hoeing, through the summer, as turnips, or any other drilled green crop, with occasional hand-weeding among the plants when necessary.

Mr Campbell observes, that 'Potatoe land may be made 'into 2½ feet ridges how soon the potatoes are taken up; and 'the ridges and furrows from which hoed oats, beans, tur-'nips, or cabbages have been removed, may be reversed, and 'left in that state till the time of sowing the oats, when the 'ridges may be considerably flattened by cross-harrowing with 'a light harrow; or by a heavier harrow than the one used 'for newly-made furrows drawn lengthways upon them; af-'ter which they are sown, covered up, and rolled. This was 'done to the land occupied by hoed oats, and a few turnips, 'last year. Land, which was occupied by oats in narrow 'ridges, may be prepared for potatoes by splitting the ridges, 'and leaving them so till the dung is put in the new furrows; 'or, if the land is mellow, the dung may be placed in the oat 'stubble furrows, and covered by splitting the old ridges; 'at seed-time the new ridges harrowed; the potatoes dibbled, 'covered up by the double mouldboard, and rolled. From 'this it will be seen, that the expense of continuing a field or 'a farm in hoed ridges, after it is once brought under that 'system, will not be near so great as a person at first sight 'would be apt to imagine. Perhaps it will not much exceed 'that of the alternate system of broadcast for white crops, 'and hoed ridges for potatoes, turnips, beans, &c. when the 'saving of seed in hoed white crops is taken into the account.'

Mr Campbell recommends a plentiful allowance of seed;—of which, as appears from the following letter, he has used at the rate of 12 pecks per acre; and he is of opinion, that a breadth of 12 inches is preferable to that of 6 inches. In this

case, the interval for horse-hoeing will be only 18 inches, if the breadth of the ridge is 2½ feet;—but, he adds, if that space is found too narrow, it is only necessary to extend the breadth of the ridge to 3 feet, or more or less as may be thought requisite. —The description of a Pulverizer, employed by Mr Campbell in the subsequent cultivation, is unavoidably postponed, for the reason already assigned.—Mr Campbell's experiments on crop 1811 are stated in the following letter.]

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

SIR,

I BEG leave to send you the following comparison between broadcast oats, and oats sown on a breadth of 6 inches on hoed ridges, crop 1811.

In tolerably good soil, immediately after potatoes, the produce from one-fourth of an English acre, sown broadcast, was one boll, two lippies, Linlithgow measure;—therefore, the produce from one acre is 66 pecks.

Sixty-six pecks, at 2s., the price at Tarbert, in the parish of Kilcalmonell, when the oats were thrashed in January 1812, is.....				£6	12	0
Deduce expense—						
Rent, being less than the price I could obtain from the meadow hay growing upon it on the foot, the buyers being at the expense of cutting and making.....	£2	10	0			
One ploughing.....	0	10	0			
Harrowing before and after sowing	0	4	0			
Sowing.....	0	0	6			
Seed, 15 pecks, at 2s.....	1	10	0			
				4	14	6
Profit.....				£1	17	6
The straw allowed for cutting down, harvesting, and thrashing.						
The produce from one-fourth of an acre, contiguous hoed ridges, was one boll, seven pecks, three lippies, or 95 pecks per acre, which at 2s. is.....				£9	10	0
Deduce expense—						
Two ploughings, at 10s.....	£1	0	0			
Two double times of harrowing...	0	4	0			
Forming 2½ feet ridges—one half day of a man 1s., and of a horse						
Carry over	£1	4	0	£9	10	0

Brought over	£1	4	0	£9	10	0
2s., which is at the rate of 10s. for a man and two horses for a whole day	0	3	0			
Flattening the tops of the ridges with a small harrow	0	1	0			
Sowing	0	1	0			
Covering the seed with the double mouldboard—one half day of a man and horse going twice in each interval	0	3	0			
Rolling the ridges	0	1	0			
Paring the sides of the ridges when the crop is growing	0	3	0			
Pulverizing the earth in the intervals	0	3	0			
Earthing up the crop	0	3	0			
Seed, 12 pecks, at 2s.	1	4	0			
Rent	2	10	0			
				5	16	0
Profit				£3	14	0
Deduce profit from the broadcast, as above				1	17	6
The balance, which is nearly equal to the profit from the broadcast, is				£1	16	6

Therefore, the profit from one acre in hoed ridges, is nearly equal to the profit from two acres broadcast.

This is the case when the meal sells at 2s. the peck; but if, in consequence of importation of grain, it shall fall to last year's prices, viz. 1s. 6d. the peck, the profits on the broadcast will be reduced from 1*l.* 17s. 6d. to 4s. 6d., or about an eighth part of its former amount; while the profit on the acre, in hoed ridges, will be reduced from 3*l.* 14s. to 1*l.* 6s. 6d., which is only about a third part of its former amount. In these circumstances, the profit from one acre, in hoed ridges, 1*l.* 6s. 6d., will be more than equal to the profit from five acres broadcast, which is only 1*l.* 2s. 6d.

Can any thing place the superiority of hoed ridges in a more striking light, as a protection to the farmer from ruin, in circumstances which may frequently occur, in consequence of importation from foreign countries?—the low prices of a plentiful crop, such as that of 1810, operating on the reduced quantity of a scanty one, such as that of 1811.

The more the rent and expense of labour, and the less the value of produce, the greater will be the superiority of this new method

method of sowing oats in ridges, over sowing them either broadcast, or in the old method of drilling, which is not much more productive. In other words, the hoed ridges will, in all years, leave a greater balance, after deducting expenses, for the interest of the farmer—the aggrandizement of the landed proprietor—the independence and prosperity of the state;—and, in years of scarcity, they may be the means of saving them all from destruction.

The superiority of oats, in hoed ridges, over those sown broadcast, was not so great, in crop 1811, as it was in crop 1810. Perhaps the following circumstances may have occasioned the difference. 1*st*, The badness of the season, in 1811, was more unfavourable to the ripening of the oats produced by tillering, which takes place in hoed more than in broadcast oats. 2*dly*, The experiments were made in 1810, on land which had previously carried a broadcast crop after potatoes; and the greater quantity of weeds, in such land sown broadcast than in the experiment plot of 1811, immediately after potatoes, was more favourable to the hoed oats, the weeds in them being more easily extirpated. The experiment plot of 1811 was so clean as not to require any hand-weeding.

In the favourable season of 1810, as stated at the Woburn Sheep-shearing,

The produce of a drilled acre of wheat, at the market price, was	£16	4	8
Of a broadcast one	15	1	4
Superior produce of the drilled	£1	3	4

This is little more than a 13th part of the broadcast.

The produce of an acre of oats, in hoed ridges, by my experiments, was	£9	10	0
Of an acre broadcast	6	12	0
Superior produce of the hoed ridges	£2	18	0

This is nearly 6-13ths of the broadcast.

So that, without making any allowance for the favourable season in which the English drills, and the unfavourable season in which the Scotch hoed ridges, were compared with broadcast, the hoed ridges exceeded the drills, in that comparison, in the proportion of about six to one.

I am, Sir, your, &c.

Kilcalmonell, 24th Jan. 1812. A. C.

To

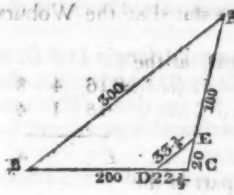
TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Directions for dividing a Triangle, or Rectilineal Figure, into any Number of Equal Parts, without the Use of Mathematical Instruments or Logarithms.

SIR,

I OBSERVE, in your valuable Magazine for December, (vol. XII. p. 444), a scheme and table for dividing triangles into any number of equal parts, which, it is alleged, would be of great use to practical farmers, more especially if the calculations could be easily performed; but I was surprised to see how limited the table given by your correspondent is, and also the operose method adopted, laying the objection, of every one not being in possession of a sector, out of the question.

To show that any triangle, or rectilineal figure whatever, may be thus divided into *any* number of equal parts, without the use of mathematical instruments or logarithms, is the purpose of troubling you with this communication.



For this intention, suppose my triangle A B C, of which the sides are severally ascertained to be 300, 200, and 180; it is required to divide it into any number of equal parts.

Let it be required, for example, to divide it into 81 equal parts.

General Rule.

Extract the square root of the number of divisions wanted, which in this case is 81, and gives 9. Divide the several sides by this last number, as follow:

$$\frac{300}{9} = 33\tfrac{1}{3}; \quad \frac{200}{9} = 22\tfrac{2}{9}; \quad \text{and} \quad \frac{180}{9} = 20.$$

Which numbers at once form a triangle, of which the sides D E, D C, and C E, are respectively of those lengths, and the area of which triangle shall be the 81st part of the given one.

The triangle A B C is drawn obtuse at C, for the purpose of showing the generality of the method. Had it been right-angled, (a case which does not happen once in a hundred times in field-measuring), its area would have been more easily found; but if we can do a more difficult case, we surely can perform

a simple one. As we have no perpendicular in this figure, the best method for finding its area (in case it is not already known) is by the rule in Ewing's Synopsis, which runs as follows.

'Let all the sides of the triangle be collected into one sum; 'from the half of which let the sides be separately subtracted, 'that three differences may be found betwixt the foresaid half 'sum, and each side. Then let these three differences and half 'sum be multiplied into one another, and the square root of 'the product will give the area of the given triangle.'

Thus, in this case,

A B = 300
B C = 200 } is 680, the sum of the three sides.
A C = 180

340 is therefore the half sum.

Then,

340		340		340
A B 300		B C 200		A C 180
40	—	140	—	160

are the three differences, which, multiplied into one another, give 896000; and this, again, multiplied by 340 (the half sum), gives 304640000; the square root of which, viz. 17459, is the area of the triangle A B C.

In the same manner, the area of the small triangle D E C, is found to be 215·4; and, dividing 17459 by 215·4 gives 81, the area wanted, allowing a small variation for fraction. This evidently proves, that any triangle, or rectilineal figure, may be divided into *any* number of parts required.

More could be said upon this subject; but I am afraid I have already transgressed upon your time and limits.

I am, Sir, your, &c.

JAMES LESLIE.

Edinburgh, 29th December, 1811.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Letter from the Reverend DR RICHARDSON *on a New Mode of Irrigation; and on the value of Peat-moss as a Soil.*

SIR, *Moy, Ireland; February 20th*, 1812.

As you were pleased to publish the letter I sent you in June last on SPRITTY MEADOWS, I shall now make some further observations

servations on that topic, so far as connected with *Fiorin Grass*, a subject beginning to excite much attention in Scotland.

Near to the commencement of that letter, I glanced a little at a paper in the Transactions of your Highland Society, containing a Report upon the water meadows of the late Duke of Buccleuch.

As that respectable Nobleman was then alive, I declined proceeding further on the subject of his meadows, lest it should be disagreeable to him to find that the measures he had adopted for the improvement of his estate, and the spirited exertions he had made in the line of irrigation, under accredited irrigators by trade, were disapproved by any one, and a prognostic made that they would not succeed.

As that worthy and much lamented Nobleman is now no more, my objection to enter further into the subject of his Grace's water meadows is removed; and I may venture to mention, that when I made inquiries in Scotland last October, I found (as I expected) that these meadows had quite failed.

That my ideas in general, on the subject of irrigation, are at variance with those of all the writers on that branch of agriculture; and that my practice is totally different from that of modern irrigators, both as to the late period in which I mow my *now* extensive water meadows, and also, in my habit of continuing to irrigate through the *whole* summer; will appear from my late Essay on *Spritty Meadows* which you were pleased to publish.

Should those who have the management of the Duke of Buccleuch's meadows chuse to try a *new experiment*, in place of the *old practice* which has failed with them, they have, to encourage them, the Report of a committee of their own countrymen, sent from Scotland, late in October last, to examine my boasted Fiorin crops, one half of which were on watered meadows; much of them standing at the time, and at least treble a usual crop: such at least was the judgment they formed of what they saw.

Never was an experiment so easily made by those who wish to try a new practice; they have only to continue their irrigation *at intervals* through the summer, so long as their waters last, and to resume it when autumnal rains, or occasional floods, again restore them, and to abstain from mowing until October is well advanced.

If the crops they then sever be not only superior in quality, but also far greater in quantity, than any formerly mowed from the same ground, or any others in their country, it is plain I have been misleading them, and they have only to return to

their

their old practice, without having incurred any expense by the experiment.

There is another subject of far greater importance to Scotland, on which my difference of opinion from every writer of your country that discusses it (so far as they have come within my reach), is equally decided; I mean the value of *peat moss* or *mossy earth*, as a *soil* to the agriculturist.

Being called upon, more than two years ago, by a Scottish Nobleman of high rank, for my opinion on the improvement of his country, abounding with peat; I gave his Lordship my opinion freely; stating my ideas were at variance with those of his countrymen who had written upon peat moss, (and the writers on the subject were numerous): I shall take the liberty of quoting the passage.

"Your Lordship will probably be surprised when I tell you, I cannot advance a single step in the business you have put me on, without engaging in hostilities in defence of SCOTLAND, and drawing my pen in support of a SCOTTISH SOIL,—not against foreign enemies, but in refuting the unmerited abuse thrown out by *her own sons.*

"The noblemen and proprietors in the HIGHLANDS, and your Lordship among them, have entered into a society for the laudable purpose of promoting the improvement of their country: You endeavour to rouse ingenuity by encouragement; and you invite communications.

"Essays are contributed, and in these you are told, *your country is not improveable.*

"Your lands, as yet untouched by man, are mostly *peaty*, some of it bog, and far more, *peaty heath.*

"PEAT, then, is the principal material you have to work upon, and *this* you are told (by those who have taken upon them to instruct you) is the *worst* and the most *unproductive* of soils.

Hear the gentlemen themselves—(page 18, vol. 3. TRANSACTIONS OF THE HIGHLAND SOCIETY.)—You are told there—

'In the Northern parts of Britain, a considerable part of the 'earth's surface is occupied by vegetable matter, known by 'the name of peat, which, being in its natural state unproductive of esculent vegetables, sets narrower bounds to national 'industry.'

Page 28. 'The properties of peat, which have chiefly claimed attention, are, its incapacity of producing vegetables capable of being cultivated in its natural state.

P. 39. 'The natural incapacity of peat to produce esculent 'vegetables, results from—it is destitute of earth, and composed

'posed of a congeries of vegetable fibres, fit to suffocate, not to 'feed, land vegetables.'

P. 40. 'Soils capable of fertility, are composed of two or 'more of the primitive earths, with a mixture of decayed ani- 'mal or vegetable substances: these qualifications are wanting 'in peat; and, as it does not yield to corruption, growing plants 'can derive no food from its spoils.'

P. 50. 'Peat, for want of an admixture of earth, is defi- 'cient in the qualifications of a soil.'

P. 69. 'Peat sterile in itself.'

P. 71. 'No sooner is the substance of peat awakened from its 'natural torpid state, than common chickenweed springs up 'every where over it.'

P. 82. 'I have thus attempted to examine the nature of that 'unseemly substance, by which a large portion of the earth's 'surface in these regions is laid waste;—investigating the causes 'of its natural sterility.'

P. 308. 'The mere sediment of peat appears to partake of 'the sterile qualities of the bog.'*

P. 316. 'Peat bogs, in their natural state, are among the 'worst of soils.'

Such, my Lord, is the account your own writers give of the material composing the surface of by far the greater part of the unreclaimed grounds in the Highlands of Scotland; and it is from *peat soil* you are to extract the produce, which is to repay the expense of cultivation.

My opinion of a *peat soil* totally differs from that of these gentlemen; and, instead of the natural *sterility* with which they repeatedly tax it, I boldly assert it possesses a *natural richness*, of which we shall not be at a loss how to avail ourselves."

Posterior to the publication of that volume of the Highland Transactions, Dr RENNIE has written numerous Essays on Bogs or Mosses, and wages a more deliberate war on *Peat Earth* than any of his predecessors, affirming its sterility with still greater confidence.

The Doctor proves, by chemical analysis, that this unhappy substance, which has been *foolishly* attempted to be converted into a vegetable soil, and applied to use as such, contains every deleterious principle, every noxious element hostile to the growth of plants: Whence it follows, that it is vain to attempt the cultivation of *peat moss*, until these poisonous ingredients, with which

* Some of the richest Fiorin crop I had this year (1809) grew upon *pure peat sediment*. I have since, in 1810, and 1811, mowed crops of equal luxuriance, from the same patch, without any *manure* or *soil*, simply by the aid of irrigation.

which it so abounds, be neutralized, and their pernicious qualities counteracted.

Happily, indeed, the Doctor promises, by the aid of the same chemical school, to enable us to make such changes in this peat soil, as will enable it to answer all our purposes, and completely do away that sterility which so many of your countrymen concur in ascribing to it.

Having long promised an Essay on the subject of our Irish Bogs, with my ideas on the measures *now* adopting for their improvement under an act of Parliament, with those I recommend; I have sent it to Griffiths's Agricultural Magazine, London; and have added a refutation of several of Dr Rennie's positions on the subject of *peat bog*, which I consider as of mischievous tendency, as well as his general assertion of their *desperate sterility*.

Whether *peat moss*, in its natural state, be unhappily so *sterile* as many of your countrymen concur in representing it,—or whether it be even in that natural state highly *fertile*, as I have repeatedly sustained, is a pure question of FACT, to be decided on by the agriculturist on *the spot*, and not by the chemist in his *laboratory*.

Such, at least, is the mode in which I have encountered the question; and though well aware, that *pure peat soil* may be highly improved by different mixtures of easy acquisition, without being sought for through chemical laboratories, I have repeatedly met the *naked question*, and engaged in the improvement of *pure peat soil* where turfs were *just* cut, without reaching the substratum, and without any additional substance, *earth*, *ashes*, *lime*, *dung*, or any extraneous material;—from this reprobated soil I have, in the face of the world, (invited to witness), mowed crops of hay, for three years, far superior to any other in the kingdom.

My Noble Friend the Marquis of Hertford has enabled me to ascertain the same fact in a new and important situation: He has laid down, under my directions, seven acres of pure mossy ground, on the top of a mountain above Belfast. The work commenced, Aug. 16th, 1811; and if I do not mow, in October 1812, a crop of hay *treble* the amount of any other in Ireland, I shall consider myself disgraced.

It is true, that, on the Marquis's peat soil, I used composts in abundance; but as they were formed of pure *peat mire*, mixed with ashes burnt on the spot, I neither introduced extraneous matter, nor induced expense. I answer, that the meadow

dow will improve in 1813 and 1814, and, should failure be suspected, it is easily kept up by the same cheap compost.

Aware of the incalculable importance of this experiment, I chose for the site, a road side, that the meadow might be at all times open to inspection; and it is only seven miles from Belfast.

Perhaps there may be more in the question of the sterility of peat soil than we are aware of;—the proof that our Irish *peat soil* is highly fertile, does not rest upon my authority *alone*; and, after the weighty authorities I have quoted, it may not be respectful to doubt the extreme sterility of the *Scotch peat soil*.

We all know of Saint Patrick's kindness to his favoured Isle—*Ille virus serpentibus abstulit atris.*

Not a particle of venom did he leave in the animal kingdom through his whole domain.

I suspect, though our gratitude be not commensurate to his services, that St Patrick also extended his kindness to the *vegetable kingdom* through Ireland; and being as sharp as Dr Rennie, in discovering the mass of deleterious elements accumulated in our *peat soil*, neutralized *them all*, and left us our peat bogs with the same powers of fertility we find them to possess at present.

Whether St Andrew has been as kind to Scotland or not, is the question at issue; and I take the decision of it upon myself.

I have promised my kind Galloway friends to visit them early in April, and to assist them in converting, at small expense, their *peat bogs* and *moors* into far better meadow than any now in Scotland.

Wherever my measures shall be proceeded on, I shall request a small patch of *pure peat soil* to be left, unsophisticated by *ashes*, *lime*, *earth*, or any fertilizing substance;—the produce of these patches will bear direct on the question at issue, *the sterility of peat soil*; and, when it shall be known the experiment is made in support of the character of their Tutelar Saint, I have no doubt but that I shall be gratified by your countrymen.

W. Richardson, D. D.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Dairy Husbandry. By Mr William Aiton, *Writer, Strathaven.*

Sir, *Strathaven, February* 1812.

Considering, as I have always done, Agriculture as the first and greatest of human affairs, I could not but feel, from its

its first commencement, a lively concern in a work devoted to its interest, and which has been so much and so justly celebrated, as that of the Farmer's Magazine. I have been a constant reader, a great admirer, and warm advocate for that valuable work; and from it I have derived much useful information on many different branches of rural economy. The Magazine commenced in the dawn of that science; and it has operated powerfully in dispelling the clouds of ignorance, prejudice, and bad habits, which then prevailed, and of diffusing the glimmerings of the morning, and increasing them into the more perfect day of agricultural knowledge. Like that of nature, it has had its chief origin in the East, and has extended from thence westward.

The superior soil, better climate, and longer period of time that the principal districts of the Lothians have been under more improved courses of husbandry, enabled the respectable inhabitants to render useful instructions to regions less fertile, and climes less genial. These districts being much more propitious to arable cropping, and the intelligent occupiers of land there having brought that department of husbandry to a pitch of perfection unknown in any other region; they have, through the medium of the Board of Agriculture, your valuable Magazine, County Reports, &c. diffused the knowledge of their improvements to every quarter of the kingdom; where they have been often imitated with success, and in some instances improved upon.

But though a knowledge of arable husbandry, which is no doubt the most interesting branch of rural economy, has been greatly matured in the Lothians, and most amply diffused, through the medium of your Magazine, to other quarters; yet there seem to be some other departments of agriculture, of no minor import, that, in my humble opinion, have not hitherto met with that attention, in your valuable repository, which they appear justly to merit. I do not mention this with a view to complain of a work I so much admire. It is impossible your correspondents, in the few years that have elapsed since the commencement of the Magazine, could have entered largely into all the numerous branches of rural economy: and it is but natural to suppose they would detail those which they themselves practised most, understood best, and had brought to greatest perfection in their own practice.

Of many different subjects that appear to me interesting, and which have not hitherto been noticed in your Magazine, to the extent they seem to merit, I shall at present confine my remarks

to

to two, viz. the *Dairy Husbandry*, and the *Cultivation of Waste Lands*. The former of these branches being still confined to a very limited district, while that species of food is consumed in all parts of Britain, it has advanced in price much more than any other description of farm produce: And as it seems to me not only the most profitable to the occupier, but also the most productive of human food, of all the modes of occupying land; and seems capable likewise of being extended, with great advantage, to many parts of the Kingdom, and instead of injuring, or running counter to other branches, is intimately connected with, and propitious to, the production of grain, the staff of the food of man; it therefore well merits, in my opinion, the serious attention of every proprietor and occupier of land, and particular notice in your Magazine.

The cultivation of *waste land*, will be found still more interesting, from the immense extent of the surface of that species of ground over Scotland, which is capable of being reclaimed;—the bad effects which its remaining in its present state has upon the climate, as well as disfiguring the aspect of the country;—the vast number of people that might be employed in reclaiming these neglected parts of the soil, to much greater advantage in civil, moral, and political points of view, than in some branches of manufacture now so much over-driven;—the increase of human food, and of course the increase of population, and of the physical strength of the nation to which the reclaiming of these wastes would lead;—besides many other considerations which render it a subject highly interesting, not only to the proprietors and occupiers of land, but also to the nation, and to every member of which it is composed.

Considering therefore the great importance of these subjects, and that neither of them have as yet been treated of (so far as I remember) in your Magazine, to the extent they well merit; I trouble you with a few remarks on each in their order; that you may give them a place in your Magazine, if you shall find them entitled to that mark of attention. I shall begin with that of the *Dairy* Husbandry, reserving what I have to say on *Waste* till your next number.

Of Dairy Husbandry.

In treating of this subject, it will be proper, I. To inquire into the history and extent of the Dairy in Scotland; and point out the advantages of that mode of husbandry, and the description of land to which it is best adapted: II. Describe the Dairy breed of cattle; the mode of rearing, feeding, and treatment; the amount of their produce; with their comparative excellence for

fattening: And, III, Give an account how the produce which they yield is manufactured into the various species of food in common use; the improvements that have been made in the Dairy; and the prices it yields.

I. History and Extent of the Dairy in Scotland;—Advantages of that mode of Husbandry;—Description of Land to which it seems adapted.

The use of the milk of cows, as a species of food, was no doubt known to mankind as soon as they could select the cow from the rest of wild animals: None who knew the value of milk, could long remain ignorant of cream, and butter into which it is formed: But the art of making milk into cheese, was only introduced into Scotland by the Romans. Pliny, in his Natural History, L. 28, c. 9, § 35, says, 'Of milk, butter was made, which is 'the most delicious food of barbarous nations:' And Strabo, L. 4, p. 200, says, 'Some of the ancient Britons were so ignorant, that, though they had abundance of milk, they did not 'understand the art of making cheese.'

From the time that the Romans held dominion in Britain, to the present day, making of butter and cheese from the milk of cows has no doubt been practised; more or less perfectly, according to the state of society at the time. It is not probable, that Dairy husbandry would become general through all parts of Scotland, even during the residence of the Romans; but, having been then introduced, the art has not been totally lost in the Island, even during the many centuries of ignorance and barbarism that followed the departure of their legions. But though something in the form of butter and cheese have been made in Scotland for many centuries past, yet it is only within the last thirty years, or so, that attention began to be paid to these operations; and many yet conduct them little better than their ancestors did some centuries ago. Great improvements have indeed been made in every part of Scotland in the making of butter; and the greater attention now paid to cleanliness, among all ranks, in comparison of what was done formerly, has no doubt made great improvement on every part of Dairy produce: But it is only in one limited corner of Scotland, that any material improvement has yet been begun to be made on the art of making cheese.

In former times, the cream was always separated from milk that was to be made into cheese, and this continues to be the general practice through by far the greatest part of Scotland. But some of the inhabitants of the county of Ayr began many years

years ago to make cheese of milk, as taken from the cow, generally termed *full-milk*, or *sweet-milk* cheese; and the practice has extended over that shire, and those of Renfrew and Lanark, and is beginning to be introduced into many other counties.

From that species of cheese having been sometimes denominated *Dunlop* cheese, it is probable that it was first made in the parish of that name in the bailiary of Cunningham, Ayrshire, though some say it obtained that name from being collected in the country, and carried to the Glasgow and Paisley markets, by dealers who lived in Dunlop. The Reverend Mr Brisbane, in the statistical account of that parish, says, the art of making sweet-milk cheese, was imported from Ireland, by a woman of the name of Gilmour, who had fled to that kingdom during the persecutions of the Presbyterians in the reign of King Charles. This is the story told by her descendants, and having once found a place in that respectable publication, it has been copied into others, and her name repeated with great *eclat*.

I would be sorry to detract from her celebrity, or to contradict the account given by that respectable clergyman; but I never understood that cheese of a superior quality was made in any part of Ireland, more than in Scotland. The following well known adage, of great antiquity, respecting Ayrshire, shows that Cunningham was celebrated for making butter and cheese, long before the reigns of any of the Stewarts, or the existence of this Barbara Gilmour. The adage is,

Kyle for a man;
Carrick for a cow;
Cunningham for butter and cheese; and
Galloway for woo'.

And the transition from the *common* to the *full-milk* cheese is so obvious, and simple, that no person who could make the one, could be ignorant of the other. It was not necessary to travel to Ireland to discover, that when the largest quantity of cream remained, the cheese was richer and more palatable, than when the cream was completely separated. The whole operations in making are nearly the same in both: and the almost only difference is in the quantity of cream put into the curd.

But whoever it may have been, who first introduced the full-milk cheese, it certainly came into general use in Cunningham, soon after the middle, and through the rest of the county of Ayr, and the greatest part of those of Renfrew and Lanark, by the end, of last century. The dairy breed of cows, and sweet milk cheese, were first introduced into Carrick, (the

southern district of Ayrshire), by Mr Fulton from Beith, in 1780; and they were only begun to be planted on the Stinchar, in that bailiary, by Andrew Lusk, in 1804. Mr Ralston carried the dairy breed, and dairy husbandry, into the parish of Kirkcum in Galloway, in 1802; and so obvious were the advantages of that mode of husbandry, compared with merely rearing cattle for the English market, that, in seven years after their first introduction, there were forty dairies established in that single parish, and many more in other parts of Galloway and Dumfriesshire. They have been introduced into, and are fast increasing, in almost every county in Scotland. Mr Traill, Sheriff-depute of Caithness, has planted that breed of cows, and set up the dairy in Caithness; and others are following his example. And many hundreds of the dairy cows of Ayrshire have been carried, every year, for several years past, to various parts of England.

The advantages of that branch of husbandry are very considerable. No species of food is more palatable, nutritive, wholesome, and substantial, than milk. It is the best food of young and old, poor and rich, and can either be used without preparation, or formed into many delicious dishes. '*Milk and meal*' have long been the boast, and the chief delight of Scotsmen; and, if they are not so rich, they are certainly more wholesome than the roast beef of our Southern neighbours. The high estimation in which every species of the produce of the dairy is held in Scotland, has raised the prices of them more than that of any other description of farm produce. The average price of the best full-milk cheese of Ayrshire, from the year 1770 to 1780, was not more than 5s. per stone, of 24 oz. per pound; and for several years past, it has sold from 12s. to 14s. per stone, and sometimes still higher; while oatmeal, which averaged nearly one shilling per peck, during the first 80 years of last century, has not, for the last 20 years, averaged more than 1s. 6d. per peck. These show the high value set upon the produce of the dairy, and that a due proportion of that valuable article is not produced in Scotland. The immense quantities of English and Dutch cheese, and Irish butter, that are imported into Scotland every year, are further evidences of the fact. If the produce of the dairy is so valuable as food, and its prices, notwithstanding the great importations of that article, have advanced, during the last 30 years, four times as much as oatmeal has done in a century, it proves to a demonstration the necessity of increasing that branch of husbandry.

Another great advantage of the dairy husbandry is, that it is suited to almost every species of soil, and does not, like some others,

thers, interfere, but is connected with, and propitious to, raising of grain, and others the most interesting branches of rural economy. When the liberal rotations, or convertible husbandry, are introduced, cattle of all sorts, except work-horses, are in a great measure excluded; and the sheep system banishes, not only all other cattle and grain, but also the human race. But the introduction of the dairy husbandry, promotes the fertility of the soil and the growth of grain crops;—gives suitable employment to a great number of women, who can find none on a store-farm, and who on arable farms either want employment, or are obliged to labour in the fields, at work not nearly so well adapted to their sex.

The dairy is suited to every species of land, except wastes that are not reclaimable. In lands that are under convertible rotations, there is seldom much pasture: but, even there, the dairy stock might be fed in the way of soiling, and be as productive of dung, and yield more profit than merely rearing and fattening yell-stock. * And I am humbly of opinion, that a larger proportion of pasture would be a very great improvement on the best rotations on the convertible system; especially on the four or five-course shifts. The longer period that intervenes between the repetition of any species of crop, the more productive will they be.

By far the greatest part of the arable lands in Scotland are still cropped two or three years, chiefly with oats, and kept in pasture for five, seven, or ten years. The dairy is remarkably well suited to ground so occupied; and it is impossible to convert the pasture of land under that course, to so good account in any other way, as the support of a dairy stock.

The dairy husbandry is generally pursued, to a certain extent, on the sheep farms in the counties of Ayr, Renfrew, and Lanark;—a proof that it is considered more profitable than rearing cows for the English market. But if these lands were to be broken up, manured, and cropped, the dairy cows would fare better, and yield a more valuable return. Wherever waste land is cultivated, the dairy ought to be introduced. Grass, turnips, and potatoes, the best food of milk cows, may be raised on such land, when grain cannot always be depended on; and even when the oats misgive on such land, the fodder will

* *Yell* or *Yiell*, in the west of Scotland, is the name given to *male* cattle, and to such of the *females* also as are not intended for breeding: Cows that have not brought a calf at the expected period, and have ceased to give milk, are called *yell-cows*.—Conductor.

be sufficient for a dairy stock, and the grain will render them comfortable and productive, when it cannot be taken to the mill.

II. *Of the Dairy Breed of Cows;—the mode of rearing, feeding, and treatment;—amount of their produce;—with their comparative excellence for Beef.*

It hath pleased the Creator of the Universe to give to his favourite—man, the noblest of his works, dominion over the beasts of the field and the fowls of heaven; and to confer on him such a degree of sagacity as enables him to maintain that superiority. He studies the tempers, qualities, inclinations, and habits, of every species; and, by a judicious and skilful treatment of each, he acquires an absolute dominion over the whole animal world. He can overawe or destroy the most powerful and ferocious; domesticate and instruct those that are capable of ministering to his comfort; and suppress those that are incompatible with his safety.

There is a degree of pliancy in animal economy, which renders many of them capable of being wonderfully changed by human industry; and that pliancy is not more conspicuous in any animal, than in the cow; the varieties of which, with their diversities of shapes, sizes, dispositions and capacities, are truly surprising. The *uris* of Lithuania is nearly as large as the elephant; while the kyloes of some of the Highland districts and islands are not much larger than the goat. The bison has a mane like a lion, a beard like a goat, and a hump like a camel: but all these are laid aside when the animal is domesticated.

Domestication and treatment produce changes no less surprising in the dispositions of these animals. Our over-fed cows are dull, groveling, and stupid; but the cows, or *bakely* of the Hottentots, are so tractable as to be entrusted with the oversight of other animals. They fight their masters' battles, gore his enemies, and are his favourite animal.

Our dairy cows are so feeble and over-fed, that they are injured by travelling, even slowly, half a mile from the byre to their pasture; while those of the Tartars are used for the saddle, and in drawing carriages. In Hindostan, the cows draw the coaches, and maintain their rate with horses at full trot; and the Hottentots train their cows to gallop, and run down the elk and antelope. These are not so many different species, but merely varieties in the breed of the same animal; and the diversity of size, shapes, qualities, and dispositions, are the effects of climate, rearing, and treatment. If such changes have already

already been made, what may not yet be effected? If a savage animal, dressed in the wild insignia of nature, has been, by human industry, formed into so many varieties, differing so much in aspect, size, and qualities, and fit to be converted to so many different uses, what may not yet be effected on that animal, by the sagacity and industry of man?

The dairy breed of cows in the county of Ayr having attained a degree of celebrity beyond any in North Britain, I was anxious to have traced their pedigree, when I surveyed that county for the Board of Agriculture; but I was unable to discover their origin. I am old enough to remember, that, between the 1760 and 1770, nothing of the shapes or colour of the present breed was to be met with in the district of Cunningham. Some of a red or brown colour might then be seen, but nine out of every ten cows in that district were at that time black: hence, all descriptions of cows were then in Ayrshire, and indeed in all other parts of Scotland, termed "*Black cattle.*" Many of them had spots of white on different parts of their body, by which they were generally denominated. A small spot of white on their face was termed a "*Bell,*" and the cow was named "*Belloch;*" if much of the face was white, the cow was said to be "Bassoned," and she was denominated "*Bassy;*" if a stripe of white ran along her back, she was said to be "Rigged," and called "*Riggy;*" if she had several spots on her body, she was termed "Flecked," and bore that name; and if the top of her tail was white, she was said to be "Tagged," and distinguished by the name of "*Taggy.*"

The cows of that part of Ayrshire were then generally from twelve to fifteen, and few of them more than eighteen stones weight, of saleable meat, when fattened, county weight of 24 ounces per pound. Being driven round their bare leys in summer, with horses, sheep, and young cattle, and getting no other food in winter but a scanty supply of oat straw, with what they could collect in the fields, they had the aspect of starvelings;—large high standing horns, with deep ringlets at their roots;—their hair coarse, and standing up;—their skin thick, and adhering to the bones;—their bones large—bodies lank; few of them then yielding more than two, or at most three Scots pints of milk per day.

From the adage quoted above, it would appear that the particular boast of Carrick, in remote times, was their cows: these, however, were not of the dairy kind, but of what are now termed the Galloway Breed. The dairy cows were not introduced into Carrick till 1790, as has been mentioned above.

This starveling breed of cows in Ayrshire has, in the course of

of the last forty years, been gradually, and as it were imperceptibly, changed into something very different in point of size, shapes, qualities, and general aspect. But though I have been an eyewitness of the progress of that important change, and recently made all possible inquiry, I am not able to account for it, otherwise than by greater attention to crossing, rearing, and feeding.

Some have alleged that the dairy breed of Ayrshire have come from Holland, and others have ascribed to them an English origin. I have no doubt but a tinge of foreign blood may have come into their veins; but I am confident that the breed is chiefly indigenous, and that the principal improvement upon that breed has been by better feeding and treatment.

The Earl of Marchmont, about the year 1750, purchased from the Bishop of Durham several cows and a bull, of the Teeswater, or some other English breed, of the same brown colour into which the dairy stock of Ayrshire have since been changed; and, having kept them some time at his seat in Berwickshire, Bruce Campbell, Esq. of Milnriggs, then factor on his Lordship's estates in Ayrshire, carried some of that breed to Sornbeg: And from that original stock many farmers on the water of Irvine were supplied. A bull of that stock, after coupling with many cows in that quarter of Ayrshire, was sold to John Hamilton of Sundrum, Esq., and left a numerous progeny on the water of Ayr. About the same period, John Dunlop of Dunlop, Esq. brought to his estate in Ayrshire some cows of a brown colour, and larger size than the native breeds. John Orr of Barrowfield sent from Glasgow to his estate of Grougar, in Ayrshire, a few cows of that colour, and of a weight greatly superior to the indigenous breed: And from all these, as well as from others introduced by different noblemen and gentlemen into Ayrshire about that period, an offspring was raised, and numerous crosses were made, till the brown colour was introduced, and has long ago become general.

Prior to the 1760 and 1770, there seem to have been about Glasgow, and in the possession of several noblemen and wealthy gentlemen, kept at their country seats, milk cows of a brown colour, and of much greater size than the native breed of Scotland; and some of these having been carried, from time to time, into different parts of the county of Ayr, and being generally placed on richer pasture, and better fed than the ordinary farm stock were at that time, they yielded a greater quantity of milk, and the farmers became eager to procure calves or crosses with them, in hopes of getting similar returns from their progeny. I have been anxious to discover from what

quarter

quarter this stranger breed came; but I have not yet been fully satisfied as to their origin. I remember to have heard them, forty years ago, termed Dutch cows by some, and English cows by others; but whether from the one or the other country, or from whence, I have not yet been able to ascertain.

But from whatever quarter they may have come, it is from them that the brown colour, now so universal in the Ayrshire dairy breed, has become fashionable. Perhaps something of the other qualities of that breed may also have descended to the Ayrshire dairy cows, by crossing with them: But I am not of opinion, that the present stock of Ayrshire are either completely descended, or that their superior excellence has been entirely derived, from these strangers;—I am persuaded that they have been brought to their improved state chiefly by better feeding and treatment.

The stranger breed, to which I refer, were of a size by far too large for the soil and mode of feeding at that time; and no good can result from putting too heavy cattle on any soil. When that is done, the stock will degenerate till they come down to the size which the soil can support; till which, the cattle will not thrive, but continue miserable, unproductive starvelings; with an over proportion of horns, hair, and bones; but neither flesh, milk, nor good shapes. But whenever the condition of an inferior breed is bettered, it rises to the size, and improves in qualities, equal to the soil and mode of feeding: and while it is so improving, it will be healthy and productive. And as the generality of the land in Ayrshire was at that period (1770) under the worst courses of husbandry, the herbage bad, and far overstocked, no improvement, but the reverse, could result from laying on a heavier and improved stock.

These strangers, however, were at first placed by noblemen and gentlemen on their lawns, and richest pasture; and the farmers who saw them did not procure full grown cows, but contented themselves with getting their native stock lined with bulls of the stranger-breed, and purchasing and rearing their calves. In these cases, the progeny being reared on the bare leys of the farmers, with their other stock, retained only their colour, an over proportion of bone, &c. but few of the better qualities of their dames. It was only as their condition was improved, that they could either acquire good shapes, or become productive. The greatest defect in the aspect of the dairy breed of Ayrshire, and which hurts them in the estimation of strangers, is the over-prominence of their bones. This must either have proceeded from their having been brought from a better to a worse soil, or

from

from attempting to raise the size to an improper pitch for the soil, by putting large bulls to cows of an inferior size. Wherever either of these courses is followed, the offspring get too much bone, and grow up unshapely mongrels. But, since the soil has begun to be improved, the qualities of the herbage greatly enriched, the cows not starved as formerly, but allowed abundance of fine pasture in summer, and their stalls better supplied in winter;—their large bones have been better covered with flesh, their shapes improved, and their product greatly increased.

At first, the farmers had no rules or standard for judging of the qualities of their dairy cattle; and when they saw the stranger breed, kept on a nobleman's pleasure ground, yield perhaps four times the quantity of milk that they drew from their starvelings, they imputed too much to the breed, and too little to the feeding; but experience has long ago taught them, that feeding was the great desideratum in the production of milk, as well as in the shapes and aspect of the stock.

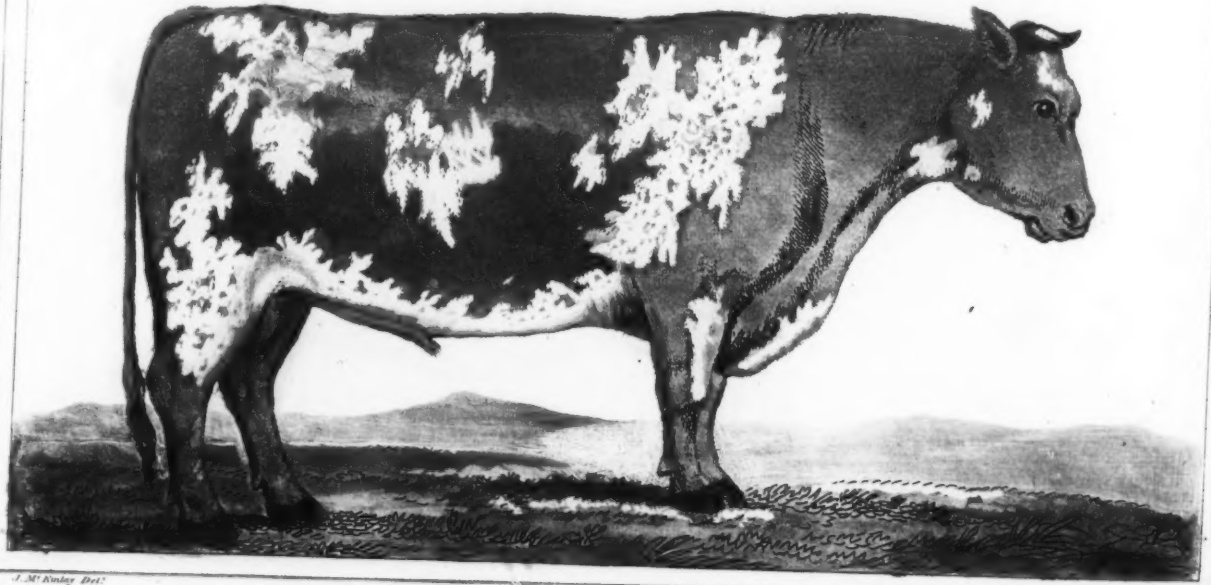
As the dairy has been the great boast of Cunningham, (the northern district of Ayrshire), for time immemorial, the inhabitants could not fail to discover, that some of their cows yielded more milk than others. When one excelled in milking, they would look out for others of the same shapes and aspect, and reject those that were different. They would naturally rear the calves of the best milkers, in hopes of their inheriting the qualities of their dames. This, and better feeding, would improve the stock, and their success would stimulate them to make still greater exertions to render their cattle better, and more productive. Such improvements once begun, on sound and interesting principles, could not fail to lead to the most beneficial results. The mutability of that animal renders it capable of great improvement.

To procure more milk, they select the cows that they find to be most productive of that fluid, and greatly better her condition: By these means the stock is improved, and, by experience and reflection, the farmers acquire more correct notions of the breed, and in what manner they can be rendered still more productive.

It has been greatly more by these means, than by importing a foreign breed, that the dairy stock of Ayrshire have attained their present unrivalled celebrity; and the farmers having become familiar with the pliancy of the animal, and the proper means of improving and rendering it productive, they will no doubt persevere in making still greater improvements.

'The *size* of the Ayrshire improved dairy cows varies from '20 to 40 stones English, according to the quality and abun-

'dance



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R. Scott Sc.

'dance of their food. If cattle are too small for the soil, they 'will soon rise to the size it can maintain; and the reverse, if 'they are larger than it is calculated to support.

'The *shapes*, most approved in the dairy breed, are as follow. '—*Head* small, but rather long and narrow at the muzzle. The 'eye small, but smart and lively. The *horns* small, clear, crook-'ed, and their roots at considerable distance from each other. '*Neck* long and slender, tapering towards the head, with no 'loose skin below. *Shoulders* thin. *Fore-quarters* light. *Hind-'quarters* large. *Back* straight, broad behind, and joints rather 'loose and open. *Carcase* deep, and *pelvis* capacious and wide 'over the hips. *Tail* long and small. *Legs* small and short, 'with firm joints. *Udder* capacious, broad and square, stretch-'ing forward, and neither fleshy, low hung, nor loose; the *milk* 'veins large and prominent. *Teats* short, all pointing outwards, 'and at considerable distance from each other. *Skin* thin and 'loose. *Hair* soft and woolly. The *head*, *bones*, *horns*, and all '*parts* of *least value* small; and the general figure compact, and 'well proportioned.' *Survey of Ayrshire*, p. 426.

The qualities of a dairy cow are of still greater importance than her shapes. Tameness and docility of temper greatly enhance the value of a milk cow. One that is quiet and contented feeds at her ease,—does not break over fences,—or injure other cattle so much as those that are of a turbulent cast. To render them docile, they ought to be gently treated, frequently handled when young, and never hunted with dogs, beat, or frightened. A moderate degree of hardiness, life, and spirits, with a sound constitution, are desirable qualities in a dairy stock; and all these are found in those of Ayrshire. Some have mentioned it as a valuable quality, when a cow subsists on a small portion of food; but that will depend on the quantity of milk which one so fed will yield. If any cow give much milk on little food, it is one of the best qualities she can possess; but of this I entertain doubts, which forty years experience, inquiry and observation, have served to corroborate and confirm. I have heard it asserted, that some cows will yield as much milk, and fatten as fast when fed on coarse, as others will do when fed on rich food; but I never met with, nor do I ever expect to see, such cows. The old adage, so common in Ayrshire, that 'A cow 'gives her milk by the mou',' has always held good, so far as I could ever perceive.

It is of the greatest importance for dairy cows to be fed, from their earliest days, on food that has a tendency to produce the milky secretion, and even to be fed on that description of food when they are not giving milk. It was common, in former

times,

times, to rear young cows for the dairy, on moors and heathy ground, and only to lay them on better pasture, and dairy food, when they came into milk; but this has been found to be an improper mode of rearing a dairy stock; and they now fare much better in their youth than they did in former times.

When young cows of the dairy breed are reared on moor, or bad pasture, and get only as much fodder as keeps them alive, they grow up, what in Ayrshire is termed '*a rough beast*,' with large horns, coarse hair, a thick skin, high bones, and other marks of a starveling; and they never after become good milkers. But when they are fed on better pasture, and provided with some green food, and good fodder during winter, they grow up proper dairy cows, having the shapes and good qualities that have been enumerated.

In former times, no other attention was paid to the dairy stock during winter, but to keep them alive. They were fed on the worst and coarsest of oat straw, or ill preserved bog-hay, cut from the marsh-meadows, and frequently half rotted in drying. The consequences were, that the dairy cows went out to the grass in May mere ghosts, lean, weak, and meagre, with their milk vessels dried up. Hence the summer was far advanced before the cows either gave much milk, or that which was of good quality. A lean cow never gives so much, or so good milk, as one that is in proper habit of body.

The greatest privations the cows of the dairy breed are still subjected to in Ayrshire, is the want of green food during nearly the one half of the year. This is no doubt supplied in part by some farmers; but not so generally as it ought, and might easily be. Many farmers make no provision for their dairy stock, except oat straw, still coarser now than formerly, and what the cattle can collect on the field: And though they may be allowed a greater abundance than formerly of oat straw, with some grain after dropping their calves; yet, as they are totally deprived of green food, or any thing that would keep them soft, and open their milk vessels, they are completely dried up, and give poor thin milk, and but in very small quantities, even during the months of May and June, when the grass is richest and sweetest.

The best remedy for that is, to provide as large a portion as possible of turnip for the dairy cows, and to give them a moderate supply of them daily through the whole winter, and early part of the spring, with a few potatoes after the turnips fail. There are some turnips provided in Ayrshire, but not nearly so many as there ought to be; and the few that are raised are often improperly applied. To protract the milk for a few weeks at the end

of

of harvest, they feed their cows chiefly on turnips till the whole are eaten up. This is bad economy. The cows' bellies are, at that season, too much distended with wet and soft food; and they stand rather in need of something to dry, than to open them. Feeding on turnips adds to that evil, and eats up the only article of green food that ought to keep the cows soft and open through the winter.

Whatever be the quantity of turnip raised, they ought to be served out in equal quantities to the Dairy stock, daily, through the winter and spring; and potatoes, malted grain, or some other substitute, when they fail. Such a mode of feeding, would prevent the juices from being dried up, the hide from adhering to the bones, remove biliary complaints, increase the milky fluid, and enable the cows to yield that which was rich and good.

Some think it is needless to give cows milky food when they are not in milk. I met, some years ago, with a clergyman attending the funeral of one of his parishioners, mounted on a large, meagre, lean horse, and labouring hard with *staff* and *spur* to keep up with the procession. On a relative of the deceased urging him to accompany the funeral to the grave, he said he meant to have done so, but found his horse could not travel; which was surprizing, as he had given him *three measures of grain that morning.* Some person present expressed a doubt, that the horse had not gotten so much every day. The clergyman said he had got no grain since last time he rode, about three weeks before. Too many farmers treat their Dairy cows, on the same principles as this worthy divine did his horse,—give them no milky food when yell. But those who do so, will find their cows as incapable of giving good milk, after they calve, as the clergyman's horse was to travel, even when he had got *three measures of grain* that morning.

Even young cows, intended for the Dairy, ought to be fed from the time they are calves, on food suitable for milk cows; and treated nearly as their dames. Such food and treatment have the greatest tendency to form the milk vessels of the young cows, and rear them with Dairy qualities: and, when they come into milk after being so formed, they will produce the most copious secretions of the milky fluid. It is by such feeding and treatment, more than any other thing, that a calf is formed into a Dairy cow; or into a 'rough beast,' fit for labour, able to travel and endure fatigue with meagre food, and to be converted into beef when better fed. In a word, those who wish to rear and keep a Dairy breed in any thing like perfection, must provide them with abundance of such food as is suited to the production

duction of milk; and they must supply them with such food, at all periods of their existence;—when they are young, and when full grown,—when they are in milk, and when they are yell.

The dairy stock of Ayrshire are, in general, fed on pasture from the beginning of May till the end of harvest; and they fare better or worse as they happen to be placed on rich or poor land, and a due proportion of stock laid on. Soiling, or feeding wholly in the byre or court-yard, is but seldom practised in the western counties; but it seems as well adapted to the support of the dairy as that of any other description of stock; and will likely come more into use, as the soil is better improved, and a larger proportion of the richest artificial grasses shall come to be raised.

Many advantages arise from that mode of feeding stock. The cattle are not fatigued, a thing of great importance to a dairy stock; they do not injure the ground or the pasture by poaching; their dung and urine are all preserved, and, being of a very superior quality, are a great acquisition on a farm; while the cattle are not injured by the vicissitudes of the weather. But what is of still greater importance, the clover and other leguminous plants, which draw a considerable part of their food from the atmosphere by their leaves, are not eaten and trodden down, and thereby prevented from attaining perfection; but, by being allowed to send out their leaves and attain full growth, they come to greater size, and yield double the quantity of food than when they are still kept dwarfish.

But though complete soiling is seldom practised, a considerable quantity of rich green food is served out to the dairy stock in their stalls at night, when they are kept in the byre, or when they are brought in to be milked; and especially during the harvest months when the pasture begins to fail. The second growth of clover, after the hay crop, is always so applied, either to the dairy cows, or work horses on the farm.

The dairy cows in Ayrshire, where the lands are enclosed, are generally laid out during night in summer, and till the severe weather in harvest, about the time that the crop is got in. But in the county of Lanark, and towards the moors, even in Ayrshire, where the land is not so well enclosed, they are kept in the byre during night. Both practices have their advocates. Those who have no fences, and are too indolent to rear them, content themselves with herding their cows, and tying them up in the byre during night; and it is not uncommon for people to argue in behalf of their own practices, whatever these may be. But all who have the benefit of good fences, or are so industrious as to make and keep them good, never fail to lay out their

cattle

cattle at night, and to allow them the cover of the byre a few hours in the day-time, in very hot weather. This is certainly much better than to march them round their pasture, under the direction of a herd and dog, and lodge them in byres during the night, even in summer.

Mr James Ralston in Fineview, parish of Kirkcum, Galloway, who has now the largest and best conducted dairies in Scotland, manages them in a way that ought to be more generally known and imitated. That at Fineview, which I have carefully surveyed, consists of sixty excellent cows of the proper Ayrshire breed. These he keeps constantly in the byre, till the grass has risen so as to yield them a full bite. The pasture ground on that farm is dry and sandy; and whenever the weather becomes hot, and the grass begins to fail, he keeps his cows in the byre, and feeds them on cut grass, from six o'clock in the morning till six at night, and turns them out to pasture for the other twelve hours. Whenever rains renew the pasture, the house feeding is discontinued, and the cows are kept constantly out. When the pasture begins to fail in harvest, the cows are supplied with the second growth of clover, and afterwards with turnip, strewed over the field; and when the weather becomes severe, about the end of October or beginning of November, the cows are lodged in the byre during the night, and have a regular supply of oat straw and turnip. The inferior turnip, with their foliage, are eaten up at the end of harvest, and early in winter, to protract the milk as long as possible; and part of the best and soundest are stored up to be served out, a small quantity daily, during winter, and the early part of spring, to keep the cows open in their bellies, and in a fresh and milky habit of body. When they fail, the ruta baga are used, and after them some potatoes. Chaff, oats, and potatoes, are boiled for the cows, and ryegrass hay served out to them, after calving, till the grass can afford them a full bite. They are never allowed to poach the fields in winter, or to nip up the young grasses as they rise in the spring.

The dairy cows, and indeed every species of live stock, are very much injured, by being denied a due supply of salt. Salt forms an essential ingredient in the food of every species of domesticated animals. We feel how requisite salt is to the health and comfort of the human race. It is equally so to that of cattle: salt softens the skin of the domesticated kinds, and makes their hair or wool softer, finer, and more shining. When horses are fed on bruised whins (*Ulex Europæus*), or any species of food abounding with salt; or when a handful of

salt

salt is put into their food daily, their pile becomes soft and shining. The superior quality of the wool of the Spanish sheep, proceeds chiefly from their being supplied with abundance of salt. When salt is given to cows, it improves the quality, and increases the quantity, of their milk. It is necessary to cows; and they relish it so much, that they submit to eat the wet litter from under the horses, or on the dunghill, however much besmeared with dung, merely because it is impregnated with the salt of the horses' urine. What pity is it, that an animal so valuable, and whose produce depends so much on her being properly fed, should be reduced to the necessity of *eating litter mixed with dung*, in order to obtain salt, with which they ought to be amply provided!!

The *blame* of this privation does not altogether rest with the *farmers*. The principal share is attached to the *Government*. The duty on salt is, of all others, the most improper. The revenue it yields is trifling, compared with the injury which it does, in depriving cattle of that necessary article of their life and comfort. It may be easily raised from some other article in common use. The Government need not be so much afraid of the *salt of the ocean* being exhausted, as to put all the domesticated animals on short allowance, in an article so much connected with their comfort and utility.

The dairy cows have often been injured by being allowed too little room in the byre; and if they were occasionally curried, it would benefit them greatly.

The produce of the dairy cows are, their calves, their milk, and their carcases for beef.

[To be continued.]

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Letter from a Member of the Morayshire Farmer's Club.

SIR, *Elgin, 1st November*, 1811.

BEING well aware how much satisfaction you derive from the general dissemination of agricultural knowledge, and how much the present spirit of inquiry and attention to this great and national object has been produced and directed by your valuable Magazine; I am convinced it will give you pleasure to know, that a very respectable Society has been established here for twelve years past, having the encouragement and communication of agricultural improvement as the leading feature in their union.

They

They meet on the first Friday of every month, except January, September, and October, when domestic and local concerns are supposed to keep every good farmer at home. After a plain dinner, and during the circulation of a moderate quantity of whisky punch, it is a rule, in this Society, to discuss some topic (previously prepared by a committee of their number, and known to all its members) interesting to agriculturists. As the object is to acquire a knowledge of facts, from the result of long-tried experience, or the issue of recent and well-conducted experiments, rather than amusement by the excursions of fancy into the regions of theory, our topics are usually of a plain and practical tendency. On these, however, a variety of opinions, maintained in a firm but temperate manner, must be expected in a Society composed of 40 or 50 persons.

Of this description, and productive of such effects amongst us, I select the few following questions, as *a sample* of our subjects. My reason for doing so, is a hope that they may excite the attention of some of your numerous correspondents, and perhaps produce a discussion that shall more fully display their merits than that which has already taken place. In such an event, it is not to be expected that the Society, as a body, should take any part, whatever its individual members may feel themselves disposed to do. I remain, Mr Conductor,

Your obedient servant,

A MEMBER OF THE MORAYSHIRE FARMER CLUB.

Question 1. Would it be for the interest of heritor and tenant to give run-out lands at a lower rent for the first few years (and what number) of a new lease; taking the tenant bound to leave them, at his removal, under a rotation of crops to be agreed on betwixt them when the lease commences, specifying the amount of deduction for these few years?

2. If an heritor lets open-field land, particularly such as is adapted to pasture, and afterwards agrees to make and keep it fencible during the lease (the tenant being liable for all undue depredations), how much more per acre is such land worth? Or, what percentage on such outlay by the heritor is the tenant warranted to give?

3. Would it not be advantageous to the north of Scotland in general, to have the days on which cattle and other markets are held more clearly ascertained, and in future invariably fixed, according to the NEW STYLE, rather than in their present unfixed and doubtful state? In what manner could such a measure be most effectually accomplished?

4.

4. Suppose a tenant enters on a farm of 200 acres of good light land, which is entirely run out by over-cropping; by what mode of management may he, at the least expense, and in the shortest time, bring the whole of it into good heart?

5. Suppose that there are no restrictions on the above tenant, and that he has no intention of renewing his lease at its expiry; is it for his advantage to continue a five-shift rotation, (admitting that to be the one preferred) viz. 1. Turnips; 2. Barley; 3. Grass; 4. Grass; 5. Oats; to the end of his lease? If it is decided that he would be a loser by doing so, what may be the amount of his loss? or, in other words, what compensation should he receive for not following the general practice of having the whole farm under white crops for the last two years?

6. A tenant occupies a farm of 200 acres of arable land, and 50 acres of waste, but improveable, land; on a lease of 19 years: And the farm is so situated, that it has no command of town's dung, or foreign manure of any kind, except lime: Is it for the tenant's interest to improve the whole, or any considerable part of the said 50 acres of waste land?

Suppose it is not for his interest to improve the whole, or any considerable part of the waste, on so short a lease, what length of lease would render the improvement of it all, an advisable speculation?

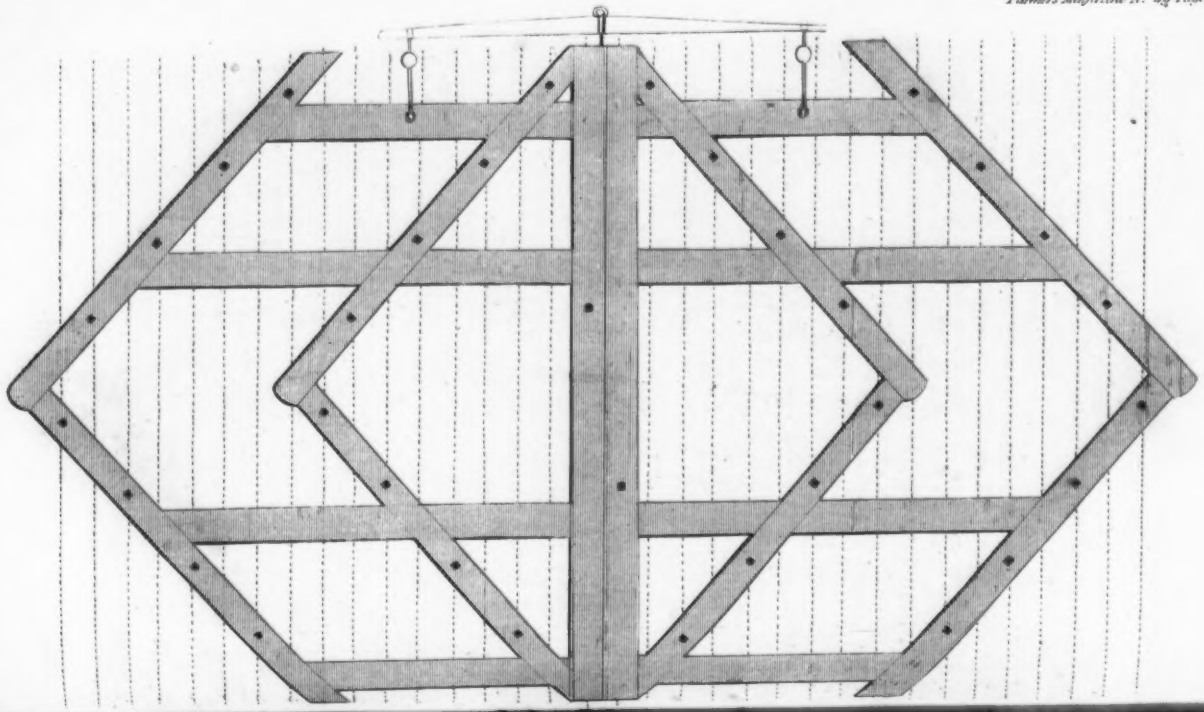
TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Description of the Diamond Harrow, invented by the Reverend MR CAMPBELL, *Kilcalmonell. With a Plate.*

SIR,

I SEND, for insertion in your Magazine, a plan of the Diamond Harrow, invented by me; with an account of the advantages which I think it possesses over those of a different form. It has been used by others, as well as myself, for many years, and preferred to every harrow with which it has been compared.

Every harrow which I have seen, either actually made, or represented on paper, with the exception of the Diamond Harrow, seems to me to have one or more of the following defects: Indeed, I do not know any which has not more than one of them. 1*st*, The tines, by the manner of placing them, or by the way in which the draught is applied to the harrow, do not move in parallel equidistant tracks; so that the space passed over is not equally harrowed, or they are crowded more in some



parts of the harrow than in others, which presents an obstruction to the passage of clods, &c.

2*d*, When the harrow consists of two halves connected by hinges, and the line of junction is not along the length of the ridge, or parallel to the line of draught, but takes a diagonal direction across it, the harrow is prevented from adapting itself to the curvature or convexity of the ridge. This defect is greater and more conspicuous, the more the ridges are gathered and rounded. This diagonal direction of the joint likewise makes the harrow apt to slide off the ridge towards the furrow. Neither of those inconveniences can easily happen with the Diamond Harrow. The line of junction, between the two middle posts, being parallel to the line of draught, allows the harrow to fold more equally round the convexity of the ridge, and prevents it from sliding so readily to either side. The tendency of the harrow to get out of its proper course, is also prevented by the opposite direction of the posts balancing each other;—those on the left being opposed to those on the right; and those on the lower opposed to those on the upper side.

3*d*, When the draught chain is from one half of a harrow, (which is the case in most harrows), and the harrow at the same time is allowed to fold upward as well as downward, it is, when at work, raised up at the corner nearest the cattle: This depresses it in the middle, which forces up the opposite corner; and the tines, in both corners, are prevented from going so deep into the soil as they ought. Besides, in turning off at the ends of the ridges from the half to which the cattle are attached, the one half will be apt to rise over the other; and, consequently, the harrow will be overset, unless the driver is possessed of more care than is always to be expected. This will not happen so readily when the harrow is constructed so as not to fold upward. The Diamond Harrow will not overset, if the driver is careful to keep the traces fully stretched, in turning at the ends of the ridges. This ought to be done with every harrow and plough, to prevent the traces from getting under or among the feet of the cattle; an accident which has frequently been attended with hurtful, and even dangerous consequences. The folding down of the harrow, without its folding up, answers every purpose of adapting it to the convexity of the ridge, and sloping the sides of the ridge towards the furrow. As Lord Kaimes observes, it gives to the two halves the effect of 'two harrows in curved 'ground, and of one weighty harrow in a plane;'—and, I will add, in harrowing across the ridges, it is much more effectual in levelling a field, preparatory to the introduction of a horse-hoed crop. This property is given to the Diamond Harrow,

by the manner of fixing the hinges to it, and by having the middle posts in contact.

4th, When a harrow is pulled by two draught chains, (one from each half), fixed to the swing-tree of the two horses, without any cross-tree, unless constant attention is paid to hinder one horse from being farther advanced than the other, the harrow will be turned round, so as to prevent the tracks of the tines from being equidistant; and one of the horses will have more than his due share of the labour. This defect is obviated in the Diamond Harrow, by having its two halves connected with the two ends of a short cross-tree, as represented in the figure, to a hasp, in the middle of which is inserted the hook of the draught-chain from the cross-tree and swing-trees, usually employed in ploughing and harrowing. The using of an extra cross-tree, I learned from the modern Dickson's valuable System of Agriculture. The only improvement I have made upon it is, the making the links, which connect it with the harrow, so short as to prevent the harrow from folding so much as to be in danger of oversetting when turning at the ends of the ridges.

5th, A defect, which applies to all harrows in which each of the posts forms a continued straight line, from the fore to the hinder part of the harrows, is, that a tough furrow slice, particularly an outside one, is apt to get between two of the posts, which, until the harrow is pulled out of its then position, will prevent the tines from moving in parallel equidistant directions; and several yards in length not only of that furrow slice, but of the contiguous ones, will escape without being harrowed; which will occasion a necessity for going over the ground oftener than would otherwise happen. This defect is prevented in the Diamond Harrow, by the opposite positions and balancing tendencies of the posts already mentioned, which will not readily allow the furrow slice to get between the rows of tines in two contiguous posts; and if it should be now and then guilty of a momentary intrusion, it will not escape with impunity:—since it cannot get between two of the foremost and two of the hindmost posts at the same time, it must infallibly be harrowed by one of them.

6th, Harrows which, to prevent the above inconvenience, have the posts, or at least some of them, across the line of draught, will be heavier than other harrows; as the posts must be made stronger, being more apt, when in this position, to be split by the force applied to the tines. Besides, it will take a great number of parallel posts across the ridge, to admit of placing the tines in each post, at such a distance from each other, as will leave a free passage for stones, clods, &c. at the same time

time that their tracks are brought so near as to make the harrow effective,—the two principal things to be attended to in the construction of this implement. In the Diamond Harrow, the tines in each post can be kept sufficiently separated, and yet the tracks made by them brought near each other, by making the angles, which the upper and lower parts form at their junction, less acute than when the tracks of the tines are made more distant. The tines, in the lower posts of the Diamond Harrow, are opposite to the middle of the interstices in the upper posts, and *vice versa;* which admits of leaving a greater distance between the tines themselves, in proportion to the distance between the tracks made by them, than in harrows of any other construction.

7*th*, In other harrows constructed so as to remove the second defect which has been mentioned, by making the line of junction of the two halves the same with the line of draught, or parallel to it; two posts have been placed in the middle of the harrow, in which are fixed the hinges which allow the harrow to fold round the ridge. Those harrows answer the purpose as to the defect which they were intended to remove; but they have another defect peculiar to themselves. The middle posts are placed three or four inches asunder. This leaves a space between the tracks of the tines in the opposite posts, of six or seven inches, not so well harrowed as the rest of the space occupied by the harrow; and yet the distance between the posts is so small, that stones, clods, &c. must be continually sticking in it, particularly where the passage is obstructed by the hinges. If the distance between the posts is increased, say to nine inches; in order to remove this last inconvenience, then, the space not harrowed in the middle of the harrow will be twelve inches, if the breadth of the posts is three inches; and it will be eleven and a half inches, if the breadth of the posts is two and a half inches. It has fallen to my lot, by the simple contrivance of bringing the two middle posts into close contact in the Diamond Harrow, completely to prevent the obstructions which must take place when they are separated by a few inches, at the same time that it brings the tracks of the tines in those posts within three inches, or two and a half inches, of each other, according to the breadth of the posts.

I have thus stated to you what I conceive to be the defects, some in a smaller, and some in a greater degree, of all the harrows, the Diamond Harrow alone excepted, which I have seen or heard of. I could easily add, Mr A's harrow has one of those defects, Mr B's another, and Mr C's a third, and so on through the letters of the alphabet; but I think it more respectful to those who have been engaged in the same cause with myself,

self, the improvement of the harrow, not to couple any names with a list of defects: And as a dwarf may see farther than a giant, by being mounted on his shoulders; so the harrow which I now present to the public may have fewer defects than those which have been invented by other persons, from my having carefully availed myself of their labours.

In comparing this with other harrows, it will occur to any person acquainted with the subject, that it must be compared only with such as have an equal number of tines, and those of equal length and thickness.

Its dimensions may be increased or diminished, and the distance between the tines varied, as in other harrows, according to the nature of the soil, the strength of the cattle, and the purpose for which it is intended.

I am, Sir, your obedient servant,

ALEXANDER CAMPBELL,
Edinburgh, 22d February, 1812. Minister of Kilcalmonell.

P. S. The plan and scale of feet supersedes the necessity of any description of the harrow, except such as is contained in the account of its properties. But as it is difficult to render the construction of the hinges intelligible to ordinary tradesmen by any drawings or descriptions; models of them and of the harrow may be seen with Mr Brown, coachmaker, York Place, Edinburgh, who has politely offered to give instructions to any person who may be employed to make them. The hinges are constructed so as to admit of easily separating the two halves of the harrow for the convenience of carrying them to the homestead and smithy, or from one field to another.

Instead of the fore-bars made of wood, between which the weight of the harrow is divided, as represented in the figure, iron bars may be substituted, each of which is firmly fixed with three screw bolts, one on each post, on the upper side of the harrow. The iron bars may have three holes in each, to allow the hooks from the short cross-tree to be placed in them, so that the two halves of the harrow, when working, will exactly balance each other, in order to keep the tracks of the tines parallel and equidistant.

The breadth of the harrow between the remote tines, or the space which it harrows by one journey, is six feet ten and a half inches.

A. C.

One of the harrows above described, will in a few days be seen at Mr Samuel Morton's, Leith, cart-wheel manufactory, where instructions for making it have been given by Mr Campbell.

TO

TO THE EDITOR OF THE FARMER'S MAGAZINE.

Of the Difference in the Effect of Dung upon different Soils; and upon the same Land before and after it has been limed.

SIR,

THAT dung produces much greater effect upon good than upon bad land, when in tillage, is generally known, though not so fully attended to as it ought to be; but the difference in its effects upon different kinds of land, when in grass, though much more considerable, has been very little observed; notwithstanding it is obvious, that the dung of animals has a great effect upon all pastures which consist of what are called the finer grasses; that it has scarcely any upon land that is covered with bent-grass, or fog; and that it is of more or less value upon pastures, as herbage of the former or latter description predominates.

As accidental circumstances directed my attention more particularly to these consequences, it may be of use to publish an account of them in your Magazine, so far as they have been ascertained by my own experience; since it may induce some of your readers to communicate other facts and observations illustrative of this important subject.

In the year 1754, having occasion to carry a quantity of very fine black loam from a head-ridge of old infield land, to give the surface-water a free passage, it was laid upon outfield benty grass land adjoining, of which it covered about a quarter of an acre fully one inch thick. No grass seeds were sown upon this new covering; yet white clover, and other fine grasses, sprung up and gradually increased upon it; and the bent, upon which the loam was laid, diminished so speedily, that very little of it remained in the third year thereafter.

A few years after this, having a considerable extent of outfield land in fallow, which I wished to lime previous to its being laid down to pasture, and finding that I could not obtain a sufficient quantity of lime for the whole in proper time, I was induced, from observing the effects of the fine loam upon the surface of similar soil, even when covered with bent, to try a small quantity of lime on the surface of a part of this fallow, instead of a larger quantity ploughed down in the usual manner. Accordingly, in the autumn, about twenty acres of it was well harrowed, and then about fourteen Winchester bushels only of unslacked lime was, after being slacked, carefully spread upon each English acre, and immediately well harrowed in. As many pieces of the lime, which had not been fully slacked at first, were gradually reduced to powder by the dews and moisture

moisture of the earth,—to mix that with the soil, the land was again well harrowed in three or four days thereafter. This land was sown in the spring with oats, with white and red clover and ryegrass seeds, and well harrowed, without being ploughed again. The crop of oats was good; the plants of grass sufficiently numerous and healthy; and they formed a very fine pasture, which continued good until ploughed, some years after, for corn.

About twelve years afterwards, I took a lease of the hilly farm of Grubbet; many parts of which, though of an earthy mould tolerably deep, were too steep and elevated to be kept in tillage. As these had been much exhausted by cropping, and were full of couch-grass, to destroy that, and procure a cover of fine grass, I fallowed them, and laid on the same quantity of lime per acre,—then harrowed, and sowed oats and grass seeds in the spring; exactly as in the last mentioned experiment. The oats were a full crop, and the plants of grass abundant. Several of these fields have been now above thirty years in pasture, and are still producing white clover and other fine grasses; no bent or fog has yet appeared upon them. It deserves particular notice, that more than *treble* the quantity of lime was laid upon fields adjoining, of a similar soil, but which, being fitter for occasional tillage, upon them the lime was ploughed in. These fields were also sown with oats and grass seeds. The latter throve well, and gave a fine pasture the first year; but afterwards, the bent spread so fast, that, in three years, there was more of it than of the finer grasses.

In all these instances, where the lime was only harrowed in, and not ploughed down, the land not only continued to produce the fine grasses, but the dung of the animals feeding upon them had the same effect in increasing the quantity and verdure of the grass, as it has upon rich, loamy, infield soils; of this, the parts of Grubbet hills, above alluded to, afford a full proof at this day: Whereas, wherever the lime was ploughed down, the parts of the soil at the surface, which were not sufficiently mixed with lime, though sown with clovers, became gradually covered with bent; and the dung of the animals had little or no effect upon such benty parts.—That animal dung has little or no beneficial effect upon such pastures, is obvious from this circumstance, that, in all hilly countries, there are great tracts of benty grass land, which have continued for centuries, though constantly pastured with sheep or cattle, without any visible improvement; the animal dung neither increasing the quantity, nor improving the quality of the pasture. But it is still more remarkable that dung has no permanent effect upon such soils,

even

even when ploughed down, as appears from the following facts.

In the year 1756, about five acres of earthy outfield benty land were folded with sod-dikes, and very well dunged, with the intention of ploughing it for oats; but upon determining, afterwards, to enclose about sixty acres to be continued in pasture, of which these five acres made a part, the intention of ploughing these folds was given up; and the dikes were thrown down in the spring, well harrowed, and sown with ryegrass. The effect of the dung upon that land was very considerable the first year, a great deal less so the second, very little the third, and was not visible afterwards. Seven years thereafter, it was ploughed for oats along with the rest of the field, when the effects of the dung were expected to be considerable; but the crop was no better upon the folded part, than upon the others; nor was it any better upon the sides of the sod-dykes, where the dung had been at first fully covered in by the earth of the sods.

Some years afterwards, about ten acres of benty outfield was fallowed, and intended to be limed; but, for particular reasons, no part of it was limed. One half of it, however, was dunged from the farm-yard. The whole field was sown with oats and ryegrass seeds. The crop of oats was much better upon the part that was dunged, as was also the ryegrass the first year; but the bent spread so fast upon both parts, that no ryegrass was left the fourth year, nor was there any greater verdure upon the part that was dunged than upon the other part. When the whole field was ploughed some years after, there was no visible difference in the crops between the two parts: the crop upon both was very bad.

But from the following facts it appears, that upon that sort of soil, when properly mixed with lime, the effects of dung are not only greater, but much more permanent, whether under tillage or pasture. After laying at least 50 bushels of unslacked lime upon each English acre of the dry benty land of the farm of Frogden, * I cropped it in what was then called the Norfolk rotation; viz. 1st year, Turnip; 2d, Barley or Oats; 3d, Grass; and, 4th, Oats or Wheat. It was expected that this mode of cropping would not exhaust the land; but I found, even in the second round, that the crops were so very much worse on the thin soils, that it was necessary to allow the land to continue some years in pasture to recover its fertility; and, for that purpose, it was sown with equal quantities of red, white, and yellow clovers, with a small portion of ryegrass seeds. As the

* Both the farms of Frogden and Grubbet are situated in the county of Roxburgh, and district of Kelso.

the land had been twice fallowed, and carried three crops of turnips horse-hoed after liming, and had never been ploughed deep, the surface-soil was well mixed with lime; and accordingly, the clovers were not afterwards injured by the native bent. But as the land had been exhausted by cropping, sheep were folded upon it in nets the first summer. Their dung greatly increased the quantity and richness of the pasture; and though the effect was less the next year, it continued to be considerable, and the pasture seemed still improving after the third year. After being six years in grass, the land was ploughed up, and produced full crops. As the soil of the fields treated in this manner was in every respect similar to that of the five acres which were folded in 1756, and to the soil of the field of ten acres, half of which was dunged from the farm-yard, as already mentioned, the very great superiority in the permanency of the effects of dung in the latter instance, over that in the two former, can only be imputed to the lime.

From the preceding statement, the following conclusions deserve the attention of agriculturists.

1*st*, That animal dung dropt upon coarse, benty pastures, produces little or no improvement upon them; and that, even when sheep or cattle are confined to a small space, as in the case of folding, their dung ceases to produce any beneficial effect, after a few years, whether the land is continued in pasture, or brought under the plough.

2*d*, That even when land of this description is well fallowed and dunged, but not limed, though the dung augments the produce of the subsequent crop of grain, and of grass also for two or three years, that thereafter its effects are no longer discernible either upon the one or the other.

3*d*, That when this land is limed, if the lime is kept upon the surface of the soil, or well mixed with it, and then laid down to pasture, the finer grasses continue in possession of the soil, even in elevated and exposed situations, for a great many years, to the exclusion of bent and fog. In the case of Grubbet hills, it was observed, that more than thirty years have now elapsed. Besides this, the dung of the animals pastured upon such land adds every year to the luxuriance, and improves the quality, of the pasture; and augments the productive powers of the soil when afterwards ploughed for grain;—thus producing, upon a benty outfield soil, effects similar to what are experienced when rich infield lands have been long in pasture, and which are thereby more and more enriched.

4*th*, That when a large quantity of lime is laid on such land, and ploughed down deep, the same effects will not be produced, whether

whether in respect to the permanent fineness of the pasture, its gradual amelioration by the dung of the animals depastured on it, or its fertility when afterwards in tillage. On the contrary, unless the surface is fully mixed with lime, the coarse grasses will in a few years regain possession of the soil, and the dung thereafter deposited by cattle will not enrich the land for subsequent tillage.

Lastly, It also appears from what has been stated, that the four-shift husbandry is only proper for very rich land, or in situations where there is a full command of dung: That by far the greatest part of the land of this country, requires to be continued in grass two, three, four, or more years, according to its natural poverty: That the objection made to this, viz. that the coarse grasses in a few years usurp possession of the soil, must be owing to the surface soil not being sufficiently mixed with lime, the lime having been covered too deep by the plough.

There are other manures besides lime which to a certain degree produce similar effects, upon which some observations may be offered at a future opportunity.

I am, Sir, yours, &c.

WILLIAM DAWSON.

Edinburgh, 2d March 1812.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Remarks on MR WILKIE'S *Iron Plough.*

SIR,

FULLY satisfied that malleable iron is best calculated, not only for the construction of the plough, but also for the greater part of agricultural implements; I shall, without any apology, proceed to make a few observations on an article 'On the Introduction of Iron Ploughs,' which appeared in your valuable Magazine, No. 47. (vol. xii.) p. 341; which, if they should appear to you to merit insertion, will perhaps (in part) realize Mr Wilkie's anticipation, 'that a matter of such importance as 'the construction of an Iron Plough, will meet with a fair discussion in your valuable publication.'

That the plough should be made perfectly straight on the land-side; and that the coulter should be placed as much to the furrow side of the beam (if a bold shoulder is wanted) as circumstances will admit; I am fully persuaded will not be denied by any person who has paid much attention to the construction of the plough: But, that the setting the left handle seven or eight inches to the left of the land-side plane of the plough, does

not

not possess all the advantages ascribed to it by Mr Wilkie, I hope to make appear in the sequel. 'The ploughman is thereby permitted to walk with ease in the bottom of the furrow, and betwixt the handles, keeping the land-side plane of the plough perpendicular to the horizon; whereas those whose left handle is in a straight line with the land-side plane of the plough, must be laid over to the land-side above, to enable the ploughman to walk in the furrow.'

Now, the foregoing quotation appears to me, to contain the only advantage that such position of the left handle (or land-side stilt) possesses. 'When that is done (the plough laid over to the land-side above) the point of the coulter is turned more towards the furrow, and from the land-side; of course, the shoulder of the furrow which it cuts is not so bold and full; the friction is increased, and the mouldboard is kept too far from the furrow slice, and on that account does not set it in a proper position.' If Mr Wilkie means that the more acute the angle of the furrow which is exposed to the atmosphere, the bolder and fuller the shoulder, I am at a loss to conceive how he can account for the laying the plough over to the land-side above, increasing, or making more obtuse that angle, so long as the coulter and bottom planes retain their relative positions. That it increases the friction or occasions more resistance, may be disputed, and that the mouldboard is kept too far from the furrow slice, will depend on the position in which it is placed upon the plough.

The position of the coulter which is exhibited in a transverse section of the plough (Fig. 3.) intersecting the land-side plane six or seven inches above the sole, will only allow the point of it to stand one-fourth of an inch to the land-side of the sock, instead of half an inch as stated by Mr Wilkie: For, by the *data* furnished by himself, the land-side plane of the coulter, at the lower side of the beam, will stand only half an inch off the land-side plane of the plough. But, allowing the coulter to stand half an inch to the land-side of the sock at the point, the angle of the furrow will not be so acute as Mr Wilkie is pleased to state,—if the land-side and sole planes are at right angles to one another, which we presume is the case in all well constructed ploughs. But, to be more particular, let the perpendicular height of the beam, at the coulter hole, be eighteen inches, and let the coulter stand half an inch to the land side of the sock, which, added to half an inch that the coulter stands to the furrow side of the land-side plane, makes the coulter to recede one inch from the perpendicular. Now, at six inches (the depth of an ordinary furrow) it will be one-third of an inch

from

from the perpendicular; and, allowing the coulter to be half an inch thick at the top of the furrow, it will make the angle of the furrow about eighty-three degrees, which is only about seven degrees above the square, instead of from ten to fifteen; and that, too, calculated under the most favourable circumstances.

Now, if, when the angle of the furrow is from 75 to 80 degrees, it is the best for receiving and covering the seed, Mr Wilkie has furnished *data* by which we have ascertained that the ploughs constructed by him do not cut, and of course do not leave, the furrow in the most favourable position.

The construction of the mouldboard, upon true mathematical principles, is certainly of the first importance. That Mr Wilkie's is so constructed, we shall not at present stop to inquire; but, that he has given directions, whereby one may be constructed exactly similar to his, is what no mechanic, I think, will admit; as a mouldboard may be made agreeable to his directions, and, at the same time, be very different from that constructed by him. 'The scale (placed at the bottom of fig. 4.) is divided 'into 132 degrees; and the twist of the mouldboard is delineated by the distance at which these degrees are placed from 'each other.' Now, the length of the mouldboard (sock included) is divided into 132 unequal parts, which Mr Wilkie is pleased to style degrees. 'Towards the point of the sock 'the divisions are large; but they become gradually closer until 'No. 90, where it is understood the furrow has gotten perpendicular, after which the curve gradually diminishes towards 'the hinder part of the board, as appears from the greater distance of the degrees from each other.' If Mr Wilkie had been so kind as to have given the ratio of their decrease and increase, the data whereby they might be ascertained, or even the actual dimensions of the several divisions, it certainly would have been more ingenuous, and would perhaps have been the means of instructing a number of mechanics, in a branch in which (as one) I am ashamed to say they are very deficient.

In describing the profile of the plough, Mr Wilkie states the length of the beam at 6¼ feet; which, I think, is a very vague expression; because, the length of the beam may be a few inches more or less, without adding to, or diminishing the distance that the point of the beam stands before the sock. At the coulter hole it is 3½ inches deep, and 1¾ inches thick; but I have seen an iron plough constructed in this neighbourhood, the beam of which stands 31 inches before the sock; and at the coulter hole it is four inches deep, and 2¼ inches thick; by which the coulter is placed half an inch more towards the furrow side of the beam than Mr Wilkie's.

The

The sheath and head of the plough alluded to, are made in one piece. The sheath is fixed to the beam by two screw-bolts, which pass through the beam horizontally, and through a tail that is on the fore-side of the sheath, which reaches nearly to the coulter hole, on the furrow side; and thereby adds greatly to the strength of the beam, at that place, where it is most likely to fail.

Instead of having the cross-head upon the point of the beam, with holes in it, for making the plough go deeper or shallower, it has a slit about 4¼ inches long, through which the bolt of the bridle passes, and is shifted up and down by means of a screw, with the greatest precision, and with very little trouble. The plough can be given more or less land by a similar contrivance; both of which are found to answer the purpose exceedingly well.

I must reserve for a future communication, some suggestions on the construction of the beam of the iron plough; but I hope to see it executed upon principles, which, while the strength will be increased, will allow a considerable diminution of the weight: Of this I will in due time apprise you, as it seems to me to be the only objection that can be urged against them.

Afraid that I have already intruded too much upon your patience, I shall just notice, that a pair of *malleable iron cart wheels* have been constructed in this neighbourhood, by the same person who made the plough above alluded to; that they are very little heavier than wooden wheels, being constructed on strict mechanical principles. Should they be found to answer the end (which no doubt will require some time to ascertain) it will certainly be a great advantage, not only to the agricultural, but also to the manufacturing interests of the country.

Should you wish for further particulars respecting the construction of the iron wheels, you have only to express it, and they shall in due course be forwarded by,

Sir, yours most sincerely,

A MECHANIC.

Banks of Leven,
Dumbartonshire, February 20th 1812.

[As it was wished to obtain further information on the subject treated of in the foregoing communication, the Conductor, for that purpose, addressed several queries to this intelligent Correspondent, to whom he offers his best acknowledgments for the readiness with which he has furnished answers, in the following letter of the 29th ult.]

Com-

Comparative Expense of the Iron and Common Ploughs.

Sir,

At all times ready to furnish you with any particulars which you should require, calculated to place, in the most conspicuous point of view, the superiority of malleable iron over that of wood, for the construction of the greatest part of agricultural implements, I shall proceed to answer in succession the several queries proposed in your letter of the 26th instant.

The first cost of the iron plough is *5l.* 5s. The annual expense of maintaining it in proper repair, so far as regards those parts that are subject to wear, will be nearly the same as that of the wooden plough, and will entirely depend upon the nature of the soil. The iron plough, in the manner in which it is now constructed, is necessarily a little heavier than that constructed of wood; of course, the friction on the sole plane will be increased in proportion, and will, on that account, stand in need of more frequent repair. The value of the iron, after the plough is no longer fit for use, may be estimated at 18s.

The power of the draught required entirely depends upon the construction of the plough; so there will be no difference in that respect, if the ploughs are constructed on the same principles, except what may arise from an increase of friction on the bottom plane, occasioned by a superior weight.

It would be difficult to calculate how long an iron plough may continue in good order for work; but I think no person will accuse us of exaggerating the advantages possessed by the iron plough over that of the common wooden plough, if we state it at twenty-one years.

In making a comparison, as far as regards expenses, on all the points, between the iron and common plough, we shall take it for granted that the iron plough will continue in good order for work twenty-one years; and that a wooden plough, which performs the same quantity of work *per annum*, will be useless in the course of three years. We may omit, without affecting the comparison, the annual expense of maintaining in proper order those parts which are exposed to the action of the soil, as it may be reckoned the same in both ploughs. We may indeed, for the sake of brevity, allow, that the several parts, both of iron and wooden ploughs, which are so exposed, will not stand in need of being renewed for the space of twenty-one years. We shall by so doing require to take into account only the wooden part of the plough, which (from what is above stated) it will be found necessary to renew six times in that space of time.

Original

Original cost of the wooden plough - -	L.	3	10	0	
Interest of do. for 21 years		3	13	6	
Wooden part of the plough six times renewed -		6	6	0	
Interest of do. for the respective times -		3	6	$0\frac{9}{16}$	
	L.	16	15	$6\frac{9}{16}$	
Deduct value of the old iron mounting - -		0	5	0	
					L.16 10 $6\frac{9}{16}$
Original cost of the iron plough - -	L.	5	5	0	
Interest of do. for 21 years		5	10	3	
	L.	10	15	3	
Deduct value of the old iron		0	18	0	
					L.9 17 3

Balance in favour of the iron plough at the end of 21 years - - - - L.6 13 $3\frac{9}{16}$

Now, I think, all things considered, the repairing and putting on of old mounting, the procuring of seven ploughs in place of one, with all their concomitant expenses, we may safely conclude, *that the advantage possessed by the iron over the wooden plough, is in the proportion of two to one.* I am, Sir, &c.

FOR THE FARMER'S MAGAZINE.

An account of a Method of collecting and applying the Urine of Cattle as a Manure to Land; with a Statement of the Expense and Value; by Mr CHARLES ALEXANDER, *Farmer near Peebles; in a Letter to the Right Honourable* SIR JOHN SINCLAIR, *Baronet.*

[The worthy Baronet was pleased to transmit the following letter, with permission to insert it in this Work. The Conductor begs Sir John to accept of his grateful acknowledgements for a communication on a subject of great importance to agriculture. Every farmer admits the great value of the urine of cattle as a manure; but the best method of collecting and applying it does not appear to be yet ascertained.

A*

An account of the practice of an intelligent and respectable agriculturist cannot therefore fail to interest our readers.]

Mr Charles Alexander to the Right Honourable Sir John Sinclair, Baronet.

Sir John,

I received your's of the 14th current, with the annexed paper enclosed, anent the dung-pit which I mentioned in a former correspondence. But, through hurry in making up a report, in answer to your other requisitions on farming, at that time I did not send you an accurate statement, either of the quantity of dung I yearly procured by that method,—the expense of collecting it,—the mode of applying it,—the effects of it on the crops,—or mentioned how long it appeared to exert its effects on the soil.

It may be foreign to what you are pleased to wish being informed about in your present letter, to acquaint you, in the first instance, that the farm-onstead, of which I have sent enclosed a rude draught, is rather an original, as it was solely built at my own expense. The only indulgence I got from the proprietor, was to be allowed to take my own plan. I had examined the most modern plans of farm-onsteads, and those most approved of; but still I conceived them deficient in some essential part, particularly with regard to the most economical mode of preserving the urine of cattle, and turning it to the best account; especially since soiling on clover in summer, and stall-feeding on turnip in winter, are now (very properly) practised. A large court, with all the offices built round it, is the present approved mode of farm-onsteads, with the dunghill in the middle. Commonly the barns, cart-shades, &c. make one side of the square, the dwelling house another side, and the byres and stables the third, with as much of the fourth as is not left open for passages; consequently, the access from the barns on the one side, from which all the fodder must be carried to the byres and stables on the opposite side, must be either by going round the dunghill, or over it; both of which are exceedingly unpleasant and inconvenient. But the principal defect, in that mode, appeared to me to be, that no proper method was thereby provided for collecting and turning to the best account the urine, which I always conceived, and from experience have found to be, of the greatest advantage to an agriculturist, especially where no dung can be procured but what is raised on the premises. Besides, the method alluded to hath also the inconvenience of being attended with double the labour of wheeling out all the dung at the front doors into

into the dunghill in the court, which, when there is a large collection, is attended with no little trouble; as it is, in that case, often necessary to wheel it upon the dunghill on planks; and the more repair and treading there is on dung, the less the dung will ferment. All these inconveniences are completely removed by having a dung-court by itself, and all the houses from which the dung is taken built in a square around it. In this plan, the cleaning of the houses is much easier executed, not a wheel or hand-barrow being needed; while all the urine is completely collected, and not a drop of it lost: There is, besides, a clear, clean, and comfortable court in front of all the houses round the square, with easy and convenient access from each front-door to another. In the above description, Sir, I only mean to show, that unless the onstead is originally on a proper construction, the most advantageous use of the urine cannot so well be obtained.

But, Sir, as the principal import of your obliging letter is, not to obtain a plan of a farm-onstead, and an explanation of its advantages; I shall proceed to answer other requisitions in your esteemed correspondence, in which I shall endeavour to satisfy you, as far as the nature of things will admit. You mention that some of your correspondents object to the expense of collecting the earth and carting it to the pit, and therefore desire that I should condescend on that expense. It is obvious that the expense will be greater or less, according to the distance the earth is to be carried. It is presumed, in the first instance, that the earth to be used for that purpose, will always be taken where it is nearest and best. But in a long continuance of the practice, when these places are exhausted, the earth to be used must be brought from a greater or more inconvenient distance, and therefore the expense will be in proportion; and may also vary much according to local circumstances. The question, I apprehend, is not, what will be the expense of driving the compost from the pit to the field where it is to be applied, as this will be no more than that of driving out as much dung from the common dunghill at the farm-onstead: the additional expense falls entirely on the collecting of the earth for the pit.

I wrote you on a former occasion, that we begin to collect the earth to the pit, the first opportunity after its former contents are carried to the turnip field. The place designed for getting the earth is carefully and deeply ploughed the winter preceding, and again in the spring, and all the stones picked out. As soon as the turnip sowing is finished, and the horses can be spared, we take two horses and two coup-carts, with a driver

to each, and a labourer to assist them in filling their carts. They begin at one end of the place where the earth is to be taken; proceed on, regularly taking off a spade deep (about eight inches); the carts always alternately filling and emptying, laying the earth in the pit, each load close to another, until a layer of a foot deep is laid over the area of the pit. In the same way other layers are formed, until the whole is brought to the level which corresponds to the sewer that conveys the urine from the dung court. The earth at that season is generally dry enough to prevent the carts, in laying on the upper layers, from sinking; but if that is not the case, we allow it to consolidate a week or two before finishing it. In a word, we stop no other necessary business on its account, if the whole is finished before the cattle are put on turnips, which afford the principal supply of urine. Great care is required, in laying on the last layers, that the whole surface be perfectly levelled, so that the urine may be equally distributed over the whole mass. The calculation of the whole expense is nearly as follows. The dimensions of the pit are 12 yards square and 4 feet deep, the solid contents 192 yards; the distance, at an average, is 200 yards; we go two yokings a day, of 5 hours each, and make 14 journies at a yoking.

3 men, at 2s. each *per* day - -	L.	0	6	0
2 horses, at 4s. each *per* day - -		0	8	0
	L.	0	14	0

Thus, as each cart carries half a cubic yard, the expense of 28 yards *per* day, is (as above) 14s.—or 6d. *per* yard; making the total expense of 192 yards 4*l.* 16s.

As the compost when carted to the field, although heavier by being drenched with the urine, loads better in the carts than when brought in loose and dry to the pit, we take out two cubic yards, in three carts; consequently the pit produces about 288 cart-loads; 40 of these I allow to an acre; therefore the urine produces dung sufficient for 7 acres. The way we apply it is as follows. In dunging the turnip field, we begin with the dung taken from the dung-court and straw-yard, the greatest part of which has been previously carted out and middened on the field, excepting what has been gathered in the spring: (As that is rougher and less rotted, we use it in the same field for planting potatoes, and therefore begin at the most distant part of the field with planting the potatoes.) After the field has got the ploughings and harrowings necessary for cleaning the ground, and reducing it to a proper mould for receiving the turnip seed; we with a double mouldboard plough lay out

the drills, and then cart on the dung, laying a row of small heaps, or, as provincially called, huts, in every third drill, whether for potatoes or turnip. In this way, I apply all the dung-hill and farm-yard dung; and when the whole of that has been laid on, I begin with the compost from the pit; but, instead of laying it in open drills, like the former, I give the ground a close ploughing and harrowing, and cart the compost upon the level surface, spreading it carefully and equally on the ground, which is done more readily with it than farm-yard dung; after which, the ground is drilled for receiving the turnip seed. As the plough, in forming the drills, turns the compost exactly into the middle of the drills, and does not bury it too deep, the young plants sooner get the benefit of it than of the other dung, which, being put in the bottom of an opened drill, and the drill again turned over it, the roots of the young plants are longer in reaching; and consequently, in the first stage, the plants are more vigorous on the former than on the latter drills; nor did I ever observe, in the after periods, that land so manured fell short of the other parts of the field, either when in turnips or in subsequent crops. Had the case been otherwise, it would have been perfectly obvious; for, as both practices are adopted on the same field or fields, and as this method has been now carried on for ten years, I no doubt must have known the part of the field where the compost was applied, and certainly must have discovered the difference, if any difference had been discernible.

You next, Sir, desire me to mention what quantity of urine is used for saturating the quantity of earth in the pit. This I cannot with any degree of accuracy ascertain, otherwise than by observing, that before I thought of conveying the urine by a close sewer below the surface, as is now the case, I put it on by wooden troughs above ground, which was done by keeping a reservoir open at the lowest declivity of the dung-court, where the mouth of the conveying sewer is now placed. That reservoir contained about 40 English gallons, and was emptied by filling it into the troughs, by a vessel with a handle, once a week, for five or six months; consequently upwards of 800 gallons would be applied in the season. But as that calculation is founded merely on conjecture, and as the bason might sometimes be emptied sooner or later as convenience allowed, better *data* may perhaps be afforded from the number of feeding cattle that produced the urine, and from which I made my calculation of the advantage derived from the measure. You will observe, from the draught given of the onstead, that the feeding byre contains 14 cattle, generally about 24 stone weight each, and these are kept

kept on, from four to five months; consequently each of these cattle (besides their dung) produces urine to manure half an acre of ground. There is little account made of the urine produced from the other houses in the winter months, although it is all collected into the dung-court; as, at that season, they are fed on dry straw or hay, which produce little urine but what is absorbed by their dung into which it runs. The principal source of urine is therefore from the turnip cattle; and, for that reason, the feeding-byre (as in the plan) is placed on that side of the square which comes in immediate contact with the mouth of the sewer that conveys the urine to the compost pit. In order to give a free passage to the urine in running into the mouth of the sewer, I provide about twenty pieces of any kind of coarse wood, about four or five feet long, about the size of a paling stob; set them aslant against the back-wall of the feeding byre, about fourteen inches asunder; and a little coarse straw is laid over them, to prevent the dung when thrown out at the back-doors from falling between them, or so close to the wall as to stop the urine from getting into the sewer. This is no incumbrance to the carting out the dung, as they are easily taken away, and replaced when the dung court is emptied, which is generally twice a year. It is scarce credible how great a quantity of urine is discharged from even a small number of turnip-fed cattle, and to what good purpose it may be turned, if carefully collected and economically managed.

I suspect I have wearied you with a long, and perhaps dry detail, a considerable part of which may be thought foreign to what you require in your letter. It was, however, thought that I could not convey a proper idea of that branch of farm management, without mentioning every circumstance connected with it. I have, in the plan, given a view of the straw-yard, in which 20 cattle lye every night in summer when at grass. The racks are filled every night with straw, and the open part of the court well covered once in the fortnight,—or, if the weather is wet, once a week, with all the barley-straw, stack-thatch, and all other offal straw, which is carefully collected and kept for that purpose. In winter, the same number is kept on straw, with a feed of turnips daily. The whole quantity of dung, collected in this way, sufficiently manures six acres. But as that practice is more universally adopted than the other, I shall not mention any thing about my way of conducting it.

I have the honour to be, SIR JOHN, your most obedient Servant,

CHAS. ALEXANDER.

Recapitulation—

Expense of collecting 192 yards of earth -	L. 4	16	0
Do. for turning the compost - -	0	14	0
Total charge *	L. 5	10	0
7 acres of land manured, value when ready for laying on, 3*l.* *per* acre * - - -	L. 21	0	0

The rotation followed, is, 1. Turnip;—2. Barley with grass-seeds;—3. Grass cut for hay and soiling;—4. Pasture;—5. Pasture;—6. Oats;—7. Peas;—8. Oats; and then return to Turnips.

Urine compost, -	7 acres.
Dung from the straw-yard, - -	6
Ditto from 14 feeding cattle, - -	6
Ditto from 12 horses, four of which are young colts for stock - -	6
Do. from 10 cows and 17 young cattle	8
Total -	33 acres dunged yearly, of an 8-shift course; 264 acres being under the plough.

The price of dung in this county averages 3s. *per* cubic yard; and as I allow 30 such yards to an acre, consequently 990 cubic yards is the quantity of dung obtained yearly, which, at the above price, is worth 148*l.* 10s., or, at the rate of 4*l.* 10s., for each acre dunged.

BRANCH

* Mr Alexander has omitted the previous expense of ploughing the land from which the earth is taken, and clearing it of stones, as mentioned in the former part of his letter. We are at a loss to know the reason for valuing this manure at 3*l.* per acre. If he considers it of equal quality with other dung, and he asserts that its effects are as beneficial and permanent, the value of 192 yards at 8s. will amount to 28*l.* 16s., instead of 21*l.* Con.

BRANCH II.

Review of Agricultural Publications.

A General View of the Agriculture of Aberdeenshire, drawn up under the Direction of the Board of Agriculture, and illustrated with Plates. By George Skene Keith, D. D. Minister of Keith-hall and Kinkell. Aberdeen, Brown & Co. Edinburgh, Constable & Co. London, Longman & Co. pp. 672. 1811.

The respectable author of the work before us is already known to the public by his writings, and by his experiments in distillation. In this General View, he displays a considerable knowledge of the most approved practices of modern husbandry; and has accumulated a mass of local information, which cannot fail to be interesting both to the proprietors and farmers of Aberdeenshire, and indeed, though certainly in a less degree, to agriculturists in other districts. The Doctor is evidently a gentleman of a liberal mind, a sincere friend to the best interests of his country, and by no means an incompetent judge of the measures necessary to promote its prosperity. He appears to have spared no labour to render his report useful; and we sincerely hope and believe that his industry must be rewarded with success. Indeed, the minuteness of his researches, and his solicitude to render the work as complete as possible, are apparent in almost every page of it. The multiplicity of subjects to which the attention of the county surveyors is directed by the Board of Agriculture, and which has been often a matter of complaint, does not comprise, in the opinion of the author, every necessary topic; and, to supply that defect, he has suggested two additional chapters. The first of them, he proposes, should describe 'the practices of every county or district which merit 'general imitation;' and the second, 'the defects which ought 'to be supplied, or the errors which ought to be avoided, in 'any particular county.' He has accordingly introduced, by way of example, two sections, as preliminary observations applicable to the county of Aberdeen. Besides this, he has subjoined eight pages of corrections, &c.; justly remarking, that 'it is a false pride that prevents a man from frankly acknow-'ledging where he is in the wrong.' When we add to this, that the author is extremely cautious in his expressions of censure, or rather of disapprobation, and that the Report does not,

not, as far as we have observed, contain a single sentence that can justly give offence, or wound the feelings of any individual, distributive justice seems to require that we should imitate his example; and it is most gratifying that we can do so from principle, as well as inclination; though, on some subjects, we shall take the liberty of expressing our dissent from his opinions.

The county of Aberdeen is bounded on the N. E. by the German Ocean; on the S. E. and S. by the county of Kincardine; on the S. W. by the county of Forfar,—afterwards by the county of Perth, till it meet the county of Inverness at the most westerly point of Aberdeenshire. From this point, where these three counties meet, it is bounded on the N. W. by Inverness, till it reach the S. W. corner of Banffshire; and, lastly, it is bounded on the N. W. and N. by the county of Banff, for above 100 miles, or the whole length of that county. Its greatest length, from Cairn-eilar to Cairnbulg, is 85 miles; and its greatest breadth, from Drumoak to Cairney, or from Aberdeen to King-Edward, is 40 miles. Its circumference, following all its boundaries, is 280 miles, of which 60 are on the sea coast. Though no accurate measurement has been made, the author thinks it may contain very nearly a million of Scotch acres, or 1986 square English miles.

'Taking a more comprehensive view of its relative value, its extent is very nearly *one sixteenth*, and its population *one thirteenth* part of Scotland, including the islands; and its area is *one fiftieth*, and its population *one eighty-fifth* part of Great Britain. In both these views, therefore, it is to be regarded as one of the most considerable counties of the United kingdom.' p. 2.

Since the general establishment of the feudal law, Aberdeenshire has been considered as composed of five divisions, viz. Marr, Formartin, Buchan, Garioch, and Strathboggie. The first of these, which is the largest, and in which Old and New Aberdeen are situated, is in many places mountainous, and is one of the most barren divisions of the county, though it contains a considerable tract naturally fertile, and much that has been rendered so by the industry of the inhabitants of the city. On the sea-coast, the soil of the second division is good, and highly cultivated; but, in the inland districts, there are hills and peat-mosses, and a good deal of moorish ground. Buchan, the third division, is, next to Marr, the most extensive; and since the introduction of the new husbandry, has become the most valuable, from its vicinity to the coast, and the flatness of its surface, as well as from the abundance of shelly sand, the value of which was but lately understood. The Garioch was formerly

formerly esteemed the most fertile division of the county, and was termed the granary of Aberdeen; but since lime came to be generally used, the places on the sea-coast have advanced more rapidly in improvement. The last division, Strathboggie, is hilly, and contains a great deal of moor and peat-moss; but, from the opening of the country by different turnpikes and commutation roads, there is every probability that this division, though late in beginning its improvements, will soon be well cultivated by its native farmers.

Between the mountainous inland districts and the low coast lands, there must be great varieties of climate; and the author ascribes to the ability of the farmers, in the latter situation, to plough almost constantly in winter, their more rapid advancement in improvement since the introduction of what he calls the new husbandry: whereas, in the higher districts, a plough cannot be put into the ground for a great part of the winter months. Several tables are presented, for the purpose of illustrating the climate of the county, particularly at Peterhead, situated at the N. E. point of Great Britain; and in order to ascertain the progress of heat from thence southward, along the German Ocean, a table is subjoined of the monthly average height of the thermometer at Kirktonhill, in the county of Kincardine, 36 miles south of Aberdeen. The author then adds,

'The reasons for examining this point more minutely than is 'done in the other Reports which this writer has seen, are, that the 'laws of climate ought to be attended to both by the Legislature, 'and the Agriculturist. The former should proportion taxes to the 'quality of corn that can be raised in the different districts of the 'kingdom. The latter should not only sow that species of corn, 'which will answer in the climate in which he lives; but also, if 'the climate be cold and backward, he should pay particular atten'tion to the *time of sowing*. For example, if wheat is ever general'ly raised in the county of Aberdeen, it should be sown as soon as 'possible after the autumnal equinox, that it may be firmly rooted 'before winter, and able to endure the alternate frosts and thaws of 'the spring.' p. 39.

Respecting the soil, we are informed that sand, clay, loam, and peat-moss, are to be found in every division, though in very unequal proportions in each; the higher and less cultivated parts consisting chiefly of soil of the first description, and the lower and more fertile districts of the second; while loam and peat-moss are interspersed through them all;—the former, however, in a much larger proportion in the old cultivated lands, than in those recently brought under aration.

Under the section 'Minerals,' we have limestone, slates, &c. Granite, in particular, has brought much money into the county,

county, from the demand for it for paving the streets of London. Precious stones, indiscriminately termed *Cairngorums*, are found on the high mountains of Braemar, and are sometimes sold at high prices to the London jewellers. There is no coal in the county, so far as has been yet discovered. The waters of the county seem capable of being rendered much more beneficial to its agriculture and manufactures than they are at present; for it is observed of the Dee, the largest of its rivers, 'that it does not turn the wheels of any corn mill, and very little 'of any other machinery, within 30 miles of its entrance into 'the sea.'

In forming a judgment of the husbandry of any district, it is of importance to hold in view the contents of the first chapter of the Reports, respecting *soil*, *surface*, and *climate*. Indeed this information is of much consequence in enabling the reader to peruse with advantage, and judge impartially of many of the subsequent chapters and sections. We have therefore presented, nearly in the Doctor's own words, so much of this chapter as was thought necessary to give a general view of these important circumstances.

In the second chapter, 'The State of Property,' the author declares his opinion to be against a revaluation of the lands of the county; though he admits that the rack-rent of one estate is not at present double the valuation of 1674, at the same time that he calculates the real rent of the county at *nine* times the valued rent. Nay, he observes, p. 87, 'the real rent belong-'ing to individual proprietors is, in some few cases, but a little 'more than the valuation of 1674; in a few other cases it is a-'bout twenty times that sum.' Though the Doctor supports his opinion by ingenious arguments, we must take the liberty of stating our dissent from it, upon this principle, that every man ought to contribute to the support of Government, and pay a proportion of all public burdens, according to his ability—according to the value of that property which is secured to him by its protection. It is of no consequence at what expense the value of an estate has been advanced, or whether or not any expense has been incurred, the only question is, What is its *present* value,—the income the proprietor derives from it, or, in other words, what will it bring in the market? If two estates of the same valued rent, one of which is rented at little more than the valuation of 1674, and the other at twenty times that valuation, were brought to the hammer; Would it be consistent with justice, that the former proprietors of both, should continue thereafter to pay the same amount of taxes, whether they lodged their very different fortunes with a banker, or employed them in

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the purchase of other estates? Political considerations, which are applicable to but a few cases comparatively, ought not to prevail against the decisions of natural justice. When the obvious principle above mentioned is departed from, we cannot conceive any fixed and just *data* for the imposition of the land-tax, or any other permanent annual contribution. Though the valuation of 1674 certainly was not correct, yet this rule was undoubtedly *meant* to be adhered to. We are aware that when money has been borrowed to improve an estate, it might be hard to call upon the proprietor for the same proportion of taxes as is charged against another who had never expended a shilling for that purpose; though certainly those financiers who can *correctly* estimate the profits of a farmer without any *data* whatever, could be at no loss to provide a remedy for this, or similar inconveniences.—It will probably surprise our readers to learn that any lands in Scotland should have advanced so little in value for nearly a century and a half, though we by no means intend to insinuate any doubt of the fact asserted by the respectable author.—From what is stated respecting the division of property, and the extent of land held under strict entail, it must be inferred, that the state of property in this county is rather unfavourable to agricultural improvements.—Though most of the proprietors have personal farms, in general the land is let to farmers, which the Doctor approves of in preference to the occupation of large farms by great proprietors;—an opinion in which we cordially agree with him.

After mentioning the ordinary endurance of leases, and giving a preference to those of thirty or thirty-three years, with rises of rent at the end of every ten or eleven years; the author adds some remarks upon liferent leases, and the expense of removing a tenant from a small possession, which we recommend to the consideration of our readers.

'There formerly were a great number, and there still are several, farmers, who possess liferent leases, or leases for a certain period, and, after that is expired, during the life of the lessee. There is something benevolent in the idea, that a farmer is not to be removed during his life. But though such leases were formerly much relished, it is found, by a late decision of the Court of Session, that the day after a tenant dies, the landlord may turn his wife and children out of doors, and take possession of the farm, on paying the expense of labour for the ground that has been ploughed, but not actually sown. By the former law, and invariable practice, the heirs of a liferenter, if a tenant, were allowed to remain till regularly summoned out, in the same way as if they had possessed without any lease, or by tacit relocation. This is the lowest species of tenure by which an occupier holds any land. The tenant has a title to continue until he get forty days warning

'previous

'previous to the first term of Whitsunday or Martinmas,* (whichever 'of them happens to be the term of his removal), by a regular sum-'mons before the Judge-ordinary, *i. e.* the Sheriff of the county. 'This method of removing is often troublesome; for it costs about 'fifteen shillings to remove a man out of the lowest cottage, of 'which the yearly rent may be but five shillings. The English 'forms of warning to tenants, whom the landlord wishes to remove, 'are much wanted in Scotland. And the late decision of the Su-'preme Civil Court, with respect to liferent leases, if it be founded 'on law, ought to give rise to a new act of Parliament, by which 'the heirs of a tenant, who had a liferent lease, should, as formerly, 'have the same advantages with those of a tenant who possessed 'only by tacit relocation, or had no lease at all. The single check 'which might be proper to introduce, would be a prohibition of break-'ing up grass land, or overcropping what is in tillage.' p. 91, 92.

Upon both these subjects we may take a future opportunity of offering our sentiments: Our limits prohibit us from enlarging upon them at this time. It is well known that the process of removing now in use, or rather its very obnoxious predecessor, was supposed necessary for the security of the tenant, who, at the time of the enactment, was a very different character from a farmer of the nineteenth century. It is now an useless expense to the proprietor, without in the smallest degree benefiting the tenant, or any others, excepting the law agent. In some instances it has proved a worse than useless form. A very respectable gentleman, commissioner or factor to one of the greatest proprietors in Scotland, not many years ago let a farm to a near relative of the person who then occupied it, and who was perfectly acquainted with the transaction. From these or other unexplained circumstances, the tenant was not summoned to remove, according to the usual practice, and the factor was under the necessity of submitting to a considerable loss upon the buildings and fences, which it is believed fell entirely upon himself, before he could obtain access to the farm for the new tenant. There cannot be a stronger proof of the propriety of altering the law on this point, than the clause now frequently introduced into a lease, that the tenant, if he does not remove at the expiry of it, without a process of removing, shall pay such an advance of rent thereafter as is well understood to be greatly above the annual value of the farm. If no inconvenience or injury to either party is found to result from a dispensation with the legal forms in this case, why retain them at all,—when, as in the instance above alluded to, the omission of them may, even in the most favourable circumstances for the proprietor or factor,

* By the law of Scotland, a tenant must be served with a summons of removing 40 days before the term of Whitsunday in every case, even though the period of the expiry of his lease may not be at that term, but at the Martinmas thereafter. Con.

tor, occasion to either of them a serious loss? As to cottages, we believe it is not thought necessary, in most counties of Scotland, to use any legal steps for removing the occupier, who is either a farm servant, or pays the rent of the cottage and yard in labour, most usually in harvest work:—we allude to farm cottages only. If it is necessary to expend 15*s.* to remove a cottager who pays a rent of perhaps only 5*s.*, it is not a matter of surprise that unmarried servants should be generally preferred, as they appear to be, in this county.

The decision of the Supreme Court respecting liferent leases, has always appeared to us a strange exception to the liberal principles which have for many years distinguished its decrees on questions connected with agriculture; and after all we have heard and read on the subject, that opinion remains unchanged. We humbly hope, upon farther consideration, the venerable Judges of that Court will, in future, allow the heir to retain possession until the legal or accustomed term of removal, with all its concomitant advantages, under the limitations stated by the Doctor, or such others as may effectually secure the landlord from injury. It appears somewhat anomalous to turn out the tenant's family immediately upon his death, however sudden and unexpected, though he had possessed upon a lease executed with every legal solemnity; and to allow a subtenant, deriving right from him alone, and the heir of a tenant possessing upon a verbal agreement, or by tacit relocation, to continue their possession. The loss sustained by the family of a liferent tenant must be much more severe than that which, on a similar occurrence, falls upon the families of other liferenters, who are often not in the natural possession of the lands. In the latter case there can be little or no inconvenience;—the amount of rent due to the deceased can be calculated and paid to an hour: But by compelling the heir, in the former instance, to carry his farm-stock to market at a day's warning, and therefore, as must always happen, at a great disadvantage, as well as from other causes, a loss of several hundred pounds may be suffered, without any benefit to the proprietor, or the succeeding tenant.

The following observations well deserve the attention of proprietors in similar situations.

'The proprietor's grandfather, Sir ARCHIBALD GRANT, is supposed to have planted more extensively than any man in Great Britain, (above 50 *millions* of trees, in the course of 50 years,) and lived to see some of them two feet in diameter. His son and grandson have already sold wood to the amount of much more than the estate cost a century ago (when it was purchased from the ancestor of Sir WILLIAM FORBES of Pitsligo.) The arable lands are also extensive and well cultivated; yet it is believed that, if they were to be sold separately, they would not fetch such a

'pr-

'price, as could be obtained from the wood that remains on the 'uncultivated parts of the estate, although 20,000*l.* of timber is 'supposed to have been sold by the two last proprietors. A more 'remarkable evidence of the advantages of planting, is not to be 'met with in any part of the island.'

In the section on Farmers' Houses and Offices, the author displays much liberality and judgment. Houses are now, however, so heavy an article of expense, that, whether built by the landlord, as they always ought to be, or by the tenant, it is of importance not only to attend to their proper 'distribution,' but also to their *situation* in respect to the arable fields of a farm. It is believed there are many arable farms, upon which, from the improper site of the farm-offices, it is necessary to employ at least one pair of horses for labour more than would have been required, had they been set down in a central situation. No doubt, there are circumstances to be attended to, such as the convenience of wind or water for a Thrashing-mill, which may justify an occasional deviation from this rule. From the size of Mr Walker's farm (276 acres), unless it lyes very irregular, we should have thought one set of offices quite sufficient, if put down in a proper place. Besides the waste of land, by the additional buildings and approaches, these buildings are at such a distance from the principal offices and dwelling-house, as to preclude a less active farmer from bestowing the necessary inspection; though, in Mr Walker's situation, we have no doubt such additional offices were found to be advantageous, as they will generally be upon very large arable farms.

The following observations are extracted from the section on Cottages.

'Though they (the cottages) do not look so well as the cot-'tages in the Lothians; yet, having the advantage of two a-'partments, no cottager in Aberdeenshire would choose to be 'confined to one; and, indeed, when the children are grown 'up, or any of the family sickly, one apartment is by no means 'convenient.' p. 139.—Again, p. 140: 'But, for regular 'day-labourers, or married servants, cottages built on the 'farm cannot be dispensed with.'

Though the cottages in Aberdeenshire, as in most counties of Scotland, require to be greatly ameliorated; yet we do not know, that 'the best and simplest remedy for improving them,' would be, 'to allow every cottager melioration for the stone and 'clay, as well as for the wood of his cottage.' Indeed, if it is meant of cottages possessed from year to year by farm servants, the proposed remedy is altogether inapplicable. The proprie-

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tor ought to be at the expense of erecting the cottages necessary upon an arable farm, as well as the farmer's dwelling-house and offices. But, whatever arrangement may be adopted between the proprietor and tenant relative to buildings, it is certain there can be none between the latter and his married servants. The author seems not to distinguish between cottages occupied by servants upon a farm, and those in villages.—It may just be noticed, that if cottages were attached to every arable farm, in numbers proportioned to its extent, as in the best cultivated districts of Scotland, there would be no necessity for employing men in hoeing turnips and other light field work, as the wives and children of the ploughmen and labourers would soon find it their interest, as much as it is that of their master, to offer themselves for such work; and that without a premium, as recommended by our author.

Under the title, 'Distribution of Crop,' there is presented a statement of the different crops, and extent of each, raised on the farm of Wester Fintray, in Aberdeenshire, with the number of servants, horses, and cattle; and the corresponding articles on Mr Robertson's late farm of Granton, near Edinburgh, are marked in opposite columns, as given by that gentleman in his Report of the Agriculture of Mid-Lothian. As this strange comparison, and the alleged results, are to us almost unintelligible, but seem calculated to mislead, we shall make a long extract, for the consideration of our readers.

'By comparing the different quantities of corn and green crops, 'raised on these two farms, it will be found that the produce of 'Granton, in wheat, barley, peas, and beans, at a moderate con-'version of the prices of grain, amounts to 635*l.* more than that of 'Wester Fintray, but is 150*l.* inferior in respect to the price of oats; 'consequently is superior on the whole corn crop by 485*l.*; but that 'on the green crops, viz. hay, pasture from sown and natural grass, 'potatoes and turnips, Wester Fintray is superior by the sum of '211*l.*; therefore the produce of Granton is only 274*l.* superior on 'the whole to that of Wester Fintray. On the other hand, it de-'serves to be noticed, that the rent of Wester Fintray is at present 'only 175*l.*, while that of Granton, in 1793, was 636*l.*, or 461*l.* 'more than the present rent of Wester Fintray, and 505*l.* more than 'its former rent (viz. 130*l.*) previous to 1802.—That the farm of 'Granton is now rented much higher than 636*l.* (no less, it is said, 'than 1200*l.*); that Mr Robertson has left it, and come to the pa-'rish of Arbuthnot, in Kincardineshire, where he has got the ma-'nagement of a valuable estate; while Mr Walker, who, in 1791, 'took the farm of Wester Fintray, began with less than 200*l.* of ca-'pital; but from the indulgence of his landlord for some years af-'ter the commencement of the lease, from the good opinion of his

'industry

'industry and character, which procured him credit, from living 'with economy till he had acquired some capital, and from the parti- 'cular attention paid to the rearing and feeding of black cattle, by 'the sale of which he has drawn 500*l.* in one year (while he paid 'only 50*l.* for what part of these was not reared upon the farm), 'has raised his whole stock of horses, black cattle, and farm pro- 'duce to 3700*l.*; has inclosed the greater part of his farm; has em- 'banked a thousand yards of the river Don, which frequently over- 'flowed, and destroyed the crops of the old farmers; has improved 'his land by lime, draining, dung, and green crops, and laid out so 'much on building houses, that the remainder of his lease, of which '15 years are to run (and of which for the last 11 years the rent is '215*l.* or 1000*l.* less than Granton is at present), would now sell 'for at least other 3700*l.*; while the landed proprietor, at the ex- 'piry of the 33 years, will, at least, *quadruple* his *rent*, and the *real* 'value of the farm will be *more than double* of what it would have 'been, if it had continued in the possession of *the five old farmers* 'who formerly rented it. These facts, respecting the farms of two 'very intelligent farmers, convey lessons of instruction both to the 'landholders and to the farmers, in both the southern and northern 'districts of Scotland, in respect to rent, produce, distribution of 'crops, and the advantage of large over small farms, superior to 'what are to be deduced by any arguments or speculations. It is 'only necessary to add, that Granton, 60 years ago, was occupied 'by three farmers, each of whom kept two cottagers (making only 'nine families in all), and 11 horses, or 33 altogether; and that 'Wester Fintray, at the same period, contained seven farmers: That 'Mr Walker rents four of these farms, and nearly the half of the 'fifth; but that the population was then more than double of what 'it is at present. Corn-farms require more labourers and servants 'than where a large quantity of grass is used, and cattle are reared 'in great numbers.

'This comparison will show the great difference between the stock 'raised and maintained on a farm in Aberdeenshire, in general, 'compared with that in the Lothians.' p. 163, 164.

Some remarks may be submitted upon this passage, without in any degree departing from the example which, at the outset, it was proposed to imitate.

1*st*, The produce of Granton (it is not said whether the gross or disposeable produce, though it may be inferred that the former is meant) is said to be only 274*l.* superior on the whole to that of Wester Fintray; while, in 1793, the rent of the former was 461*l.* more than the *present* rent of the latter, and is now supposed to be no less than 1025*l.* more than that rent. After a calculation of expense and profit upon Wester Fintray, pp. 203, 204, (upon which it must be observed, we pronounce no opinion), the author adds, that a profit or accumulation of capital is left

left of 300*l.* annually. Now, if we add this 300*l.* to the superior yearly produce of Granton, 274*l.*—together 574*l.*; and deduct this last sum from the *difference* between the present rents, 1025*l.*, there must be an annual loss upon the farm of Granton of no less than 451*l.*—Again, if this is not admitted, in order to make any thing of the comparison, the farmer of Wester Fintray ought to realize an yearly profit of 751*l.* instead of 300*l.*, even without allowing a shilling of profit for the farmer of Granton. When such conclusions are indisputable, it may be justly supposed, that the premises are erroneous; and, in this case, the errors are so apparent, that it is surprising they should have escaped the notice of the author; who might have contented himself with detailing the kinds and extent of the crops upon each farm, but certainly never should have taken it for granted, that an acre of any one kind of crop, even oats for instance, was precisely of the same value in two such very different situations.

2*d*, The only grounds assigned for the comparison are, that the two farms are nearly of equal extent; and that the same crops, though in different proportions, are raised upon both. No regard is paid to soil, the quantity and quality of produce, the different market prices, value of the straw of Granton crop, (by far the greatest part of which must have been sold, as no cattle were wintered, the price of which ought to have been placed against that of dung purchased); nor, indeed, to any other local circumstance affecting the value of produce, and the expense of raising it: Yet, when treating of rent, (p. 169), the author justly observes, 'that it depends more on the local situation of 'the ground, than on the fertility of the soil.' But if the absence of these *data* precludes even an approximation to accuracy, in estimating the comparative value of white crops; what shall be said of a comparison, founded upon the single circumstance of equality in point of superficial extent, between the value of green crops in the vicinity of the metropolis, and in a country parish in the county of Aberdeen;—between an acre of potatoes, turnips, and clover, in the respective situations!

Lastly, 'The lessons of instruction to the landholders and 'farmers in both the southern and northern districts,' if any instruction could be derived from such a comparison, would be, in our opinion, of a very unpleasant description. It would prove, if it proved any thing, that while the farmers of Aberdeenshire are accumulating handsome fortunes, those of Mid-Lothian cannot long bear up under their present ruinous engagements to their landlords; and the impression would be highly injurious, by producing discontent in the minds of the proprietors of the former county, and of the farmers of the

latter. But the truth is, no other conclusion can be inferred from the author's remarks, than the indulgence and liberality of the proprietor, and the successful industry of the tenant, of Wester Fintray alone.

On the subject of Tithes, the reverend author offers the following judicious remarks.

'One remarkable fact, founded on the agriculture of a portion of 'the lands of this county, demands the attention of the Legislature. 'It has been already stated, that the lands in the immediate vicini- 'ty of Aberdeen, have been improved at an expense unequalled in 'any part of the kingdom, from soil naturally unfertile. At least '2000 acres have been trenched, manured, drained, enclosed, and 'highly cultivated, and not less than 10,000*l.* of rent, and 25,000*l.* 'of produce, are drawn from these lands. But if the rector of the 'parish, or the lay impropriator of the tithes, had been entitled to 'draw the tenth part of that produce, there is not the least reason to 'suppose that 200 acres would have been improved.—Many of the 'spirited cultivators would have been well pleased to have had *one-* 'tenth of the produce *for their profit.* Most of them were enabled 'to improve their fields of granite, heath, or sand, merely by hav- 'ing nothing at all, or at any rate a *few pence*, to pay for their 'tithes. Here, while the English farmer may derive an important 'lesson, of mixing the spade with the plough husbandry, where the 'land is barren, and situated in the neighbourhood of great towns, '—the British Legislature may see, that the value of the tithes 'should be ascertained; and that those for unarable lands should 'be fixed and valued at a moderate rate, before waste lands can be 'taken into culture.' p. 176, 177.

In the section on Poor Rates, Dr Keith makes some very just and humane observations. No assessment for the poor is imposed in this county. It is a question of great importance, if it is once admitted that the wants of the poor should be supplied at all, whether that supply shall be left to voluntary contributions, or enforced by law, according to the real or supposed abilities of the contributors. The example of our Southern neighbours, has had a tendency to prejudice the public mind against the last mode; though it can scarcely be denied, that, if the poor are suffered to depend entirely upon voluntary aid, either their wants will be imperfectly and irregularly supplied, or the liberal and humane will bear more than their just proportion of the expense. In many instances, those in very affluent circumstances would escape the burden altogether. We confess, we should as soon expect the Government to be supported by pure, disinterested patriotism, as the poor by voluntary contributions. It consists with our knowledge, that in some counties where no poor rates are levied, many of this class endure

endure the severest privations, whatever may be the case in Aberdeenshire. Indeed, those who contend against legal assessments in every case, proceed upon a principle, something more than doubtful, that the affluence and humanity of every individual are in exact proportion to each other; which, notwithstanding the extensive charities of this nation, and the promptitude and liberality with which, in most cases, the rich subscribe to the relief of the indigent, will not be seriously asserted by the most superficial observer of human nature. The English poor-laws are confessedly oppressive, and ultimately injurious to that very class which they are intended to relieve. But it is surely not necessary, in order to remove the evils of that system, hastily to abandon all legal enactments whatever. The abuses so justly complained of in that kingdom, can never prevail to any alarming extent in Scotland by the present laws; —upon which we beg leave to suggest, it would be an improvement, and it is demanded by justice and policy, that the tenant, as well as the heritor, should be allowed a vote in parochial assessments.

In the section 'on Leases,' it must be painful to every friend to agriculture, the prosperity of which depends so much on the comfort and independence of the tenantry, to peruse the stipulations inserted in the leases of two great proprietors of this county. We can with difficulty believe, that any man of capital and spirit will subscribe to such obligations as not only reduce the tenant to the condition of almost a mere machine, but expose him to a series of demands which may eventually effect his ruin, in case he is so unfortunate as to incur the displeasure of the landlord or his factor. Farmers in other counties will be apt to conclude, from this account of the connexion between landlord and tenant, that agriculture must be very imperfectly understood and practised in Aberdeenshire, especially when it is considered that the very same articles and rules of management appear to be applied, in the one case, to 40,000 acres of arable land, and in the other, to 30,000. We do not pretend to know whether these stipulations are strictly enforced, far less do we mean to insinuate that any improper advantage has been taken of them against the tenantry; it is enough that they may be employed as an instrument of oppression, from which even the Supreme Court cannot be expected to relieve the sufferer. We extract the following, though not the most obnoxious, articles, from the clauses inserted in the leases upon the first of these estates.

'And where any ditches, drains, or water-runners, form, or are 'necessary as parts of, a general drainage for other farms, or for a

'district of the estate, the whole tenants, having such drains passing 'through or along the boundaries of their farms, shall be obliged to 'clear them at the same time, *if the factor on the estate shall deem 'such clearing to be necessary.*

'In case the proprietor (or his factor or doer for the time) shall 'at any time find the houses, dykes, drains, hedges, ditches, and 'gates, neglected, and in disrepair, power and liberty are expressly 'reserved to him, to order the same to be put into proper and suffi-'cient repair and condition; and the expense thereof, being ascer-'tained by the workmen's receipts, or by accounts certified by the 'factor, the tenants shall be obliged to pay the same, with interest 'from the date of the receipts or certified accounts.' p. 188.

Of the stipulations in the leases upon the second estate, the reader may be satisfied with the following specimens.

'The proprietor shall have power and liberty to make such drains 'in the lands let, as he shall see proper; and the tenant shall be 'obliged to fill them up as soon as made, with stones, if proper 'stones can be had within nine hundred yards of the drain; and 'failing thereof, with other proper materials, and to keep them in 'repair in all time after, on his own expense. The tenant is also 'bound to keep the hedges, ditches, and other fences, in perfect or-'der, by cleaning the hedges, and cutting them in the shape of a 'steep roof, and to scour the ditches as often as necessary, and to 'preserve the trees planted in the hedgerows, and yards, or any 'where else on the farm. The tenant shall have no allowance, or 'deduction, for the ground occupied by the enclosures or drains, or 'the damages which may arise in making or repairing the same; 'but if the hedges shall be cleaned and cut properly, the tenant 'shall be paid by the proprietor half the expense thereof, at the 'ordinary rates at which such work is done in the country. If the 'proprietor chooses rather to have any of the above work, relative to 'fences or drains, done by people of skill to be employed by himself, 'he may cause it to be done by them; and the tenant, upon having 'the accounts of the expense attested by the persons who have done 'the work, and presented to him, shall be bound to pay such persons, 'or to the proprietor, the whole expense of repairing the drains, and 'half the expense of putting and keeping the fences in order, without 'any other proof whatever. In case the proprietor shall enclose or 'drain the farm or possession let, or any part thereof, the tenant is 'bound to pay to the proprietor, along with his rent, six per cent. 'yearly, on all the money disbursed by him in so doing, commenc-'ing from the time of the expenditure.' p. 193, 194.

'That in case the fallow crops shall be foul or weedy, the tenant, 'at the desire of the proprietor, must plough them up, and turn 'them to a real fallow.' p. 195.

'The tenant is to have no further allowance for walls of houses, 'although he shall have built to a greater value, and shall not, not-'withstanding, be at liberty, either at his removal, or for three years

'preceding,

'preceding, to throw down or demolish any additional walls built: 'it is to be understood, that if the tenant has furnished or paid for 'the timber, and glass windows, and slates, (if good Esdale), they 'shall remain his property, and he shall, at the issue of the tack, 'either be paid for them, according to the appreciation of persons 'of skill, to be mutually named by the proprietor and him, or to be 'allowed to take them away, in the proprietor's option.' (p. 199, 200.) If it should be the option of the proprietor, that the tenant shall take away the timber and slates, his loss upon these articles must be very considerable.

We cannot agree with the author in his assertion, that 'a 'tenant, on a *six-shift course*,' viz. two white crops, with an intervening turnip one, and three years grass, '*cannot* pay 'above two-thirds of the rent which *he could pay on a four-shift* '*one*; nor above three-fourths of what he could pay on a five-'shift course,' page 182; if he means that the quality of the soil, and local circumstances, are the same in all the three rotations. Nor is it quite certain that a five-shift course, so often recommended by him, is best adapted to the soil, and present condition of the lands of the county. Those who have cultivated light soils to a great extent, (and of such the remark must be understood, as upon these alone can turnips be raised with advantage), have ascertained, from long experience, that land of that description, unless so situated as that the farmer can command a great addition to the home manure, cannot be preserved in a state of fertility during a lease of ordinary endurance, under a four-years rotation, even when the turnips, and a great proportion of the clovers, are consumed upon the ground by sheep, —a mode of management which appears to be little known, at least seldom practised, in this county. The author himself acknowledges, 'that there is too little putrescent matter for the 'purpose of manure, by adopting this course, in a county of 'which so large a proportion is still uncultivated, and still 'more in a poor state of cultivation.' (p. 238.) He afterwards admits his extreme partiality 'to this rotation;—that 'he had excellent crops for the first four years, and tolera-'able crops on the second rotations;—but last year,' he adds, 'its want of tenacity was evident; and it is now in turnips,— 'will be sown with bear and grass,—and will lye at least two 'years in grass.' (p. 240.) After these admissions, it is not easy to conceive any good reason why the author should persist in asserting (p. 238) that 'this is by far the most profitable course 'to a farmer.'—A similar dissent must be expressed from the practice approved of by the author (p. 200), of substituting a crop of pulse in place of the third year's grass; as oats, in almost every situation, are the most suitable crop, after breaking up grass lands that have lain more than one year.

In the chapter 'Of enclosing,' the author inform us (p. 221), 'that the kind of enclosures which is most favourable to warmth, 'viz. raising of hedges, is not so generally practised in Aber-'deenshire as could be wished. Where granite is near at hand, 'it is not to be expected that thorn hedges should be often 'raised.' And in page 223, he observes, that 'the great de-'fect of this county is the want of belts of wood on the north, 'north-west, and west; and on the north-east and east, where 'this can be done.' A great part of the county is perhaps not well adapted to the growth of thorn hedges, which is often the case where granite is found in great abundance, especially on elevated situations. The best method, therefore, of obtaining shelter in such places, must be by planting belts of wood, as recommended by the author; who adds, 'that were they gener-'ally raised in proper places, the local heat of a great part of 'the county would be increased from five to eight degrees more 'than the general heat of these districts is at present, from 'April to October.' Independent of the ornament and ultimate value of such plantations, it deserves notice, that there are few large farms, in any district, on which small patches of land might not, without any diminution of rent, be appropriated to this highly beneficial purpose.

Under the section 'Of fallowing,' the observations of the author are quite correct, as far as they relate to light soils fit for turnips, upon which a naked fallow is altogether unnecessary, as part of a regular rotation. But the following remarks will not be approved of by the most intelligent farmers of this part of the island, whose experience assures them, that neither drilled beans, nor any mode of cultivation yet known will, upon strong clay soils, supersede the recurrence of a summer fallow. All that the culture of drilled beans upon such soils can do, and even that is of great consequence, is for a time to put off the evil day; which, until we are better informed, it is firmly believed must come at last, and perhaps be felt more severely in consequence of its being longer delayed.

'In Buchan, where there is much stiff land, particularly near 'the sea-coast, summer-fallow is used by many of the farmers, 'and may properly be used *where drilled beans cannot be raised.* 'In several other places of this county, *fallowing may be used* '*occasionally*; but the fact is, that very little fallow is used, and 'comparatively a small proportion of it is necessary in Aber-'deenshire.' p. 230.

The author seems to disapprove of consuming turnips on the ground by sheep in this county; though he admits the benefit which light soils derive from their treading, independent of their

dung

dung; assigning as a reason, that there is a great proportion of unimproved lands, which need all the dung that can be collected by every possible means. In various places of this work, the author warmly recommends the extension of tillage to lands not hitherto cultivated; and, upon the supposition that his wishes may be realized at some future period, indulges in very sanguine calculations of the numerous population which would thus obtain the means of subsistence. Though we wish as ardently as the author, that every acre in the kingdom was improved to its utmost pitch; yet many may be inclined to think, that it would be most profitable to the cultivator, and most beneficial also to the public, to bring the lands, presently under the plough, to as high a state of fertility as possible in the first instance; and there appears to be in Aberdeenshire, as well as in many other counties of Scotland, a very large field for such exertions, in which the capital of agriculturists might, for a time, find sufficient employment. If three acres, for instance, can be made to produce as much of grain or green crops as four acres do under the present management, with little or no additional expense after a few years, such an improvement is certainly to be preferred, on every account, to a large expenditure on the cultivation of very inferior soils, which, from the present expense of labour, &c. is often not the most profitable speculation. On light soils, such as are here alluded to, there is not a more cheap and expeditious, as well as a more certain method of obtaining this superior produce, than by consuming, if not the whole, at any rate, a greater or less proportion of the turnip fields, according to circumstances, upon the land with sheep. If a half or a third of the turnip crop was disposed of in this way, and the remainder given to cattle in the straw-yard, or at the stalls, the produce of the white crops would be augmented; all the dung obtained which the fodder and litter on the farm can produce; and, from the superior richness of the soil, a less quantity of dung would be required for the turnip fields in future.

On Swedish turnip, or Ruta baga, the Report contains a number of useful observations; for which we must refer our readers to the work itself, as we have not room for such extracts as would do justice to this part of it. In a county so far north as Aberdeen, this valuable root must be of more than usual importance after a severe winter.

The following extract may not be unacceptable to some of our readers.

'We may talk of the luxury and refinements of the present age, 'and boast of our superior attainments in horticulture; but if we 'we examine facts attentively, we shall find that our ancestors paid

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'more attention to this than at first we are apt to suppose. At any 'rate, it is a striking proof of the luxury of the Romish clergy, and 'of their uncommon skill in the raising of fruit trees, that when Mr 'Ferguson was laying out his new orchard, he found in the Abbey 'garden, first rich soil, above three feet deep; secondly, a well-'paved causeway of granite; thirdly, a bed of pure sand one foot 'deep; fourthly, another causeway of granite; and below the whole 'a considerable depth of rich mould. No greater precaution could 'have been taken to hinder the roots of the fruit trees from being 'injured, by piercing into a cold or wet subsoil.' p. 267.

When treating of woods and plantations, the author observes,

'If the landed proprietors would only enclose all the barren 'grounds which are not worth the expense of cultivation, we should 'have no occasion for wood either from Prussia, Norway, or North 'America. There are thousands of fir trees in Braemar, some of 'which are nearly 6 feet in diameter, which are superior in point of 'quality to any wood of that denomination that was ever imported 'into any place in Great Britain: And both the Legislature and 'the Highland proprietors, each in their different spheres, should 'take care that this country be independent of any sort of ship 'timber. England can always raise oak and elm; and Scotland 'can raise fir on the mountains and hills; and beech and ash in the 'more cultivated districts.' p. 373.

Though there may be nothing novel in the following remarks, they are of such great importance, not only to those immediately interested, but to the prosperity of agriculture in general, that we hope to be excused for their insertion. It is only necessary to observe, that there can be no good reason assigned why the tenant, who plants at his own expense, should not be allowed, at his removal, the *full value*, and not a *moiety* of the value, of such plantations.

'But in order to encourage this' (the planting of belts and detached pieces of land) 'as a general practice, two things appear to 'be necessary.

'The first is, that the proprietors of entailed estates should be 'empowered by law to burden their property with the appretiated 'value, at their death, of all houses, enclosures, and plantations; 'and that the amount of this burden might be applied, in the first 'place, for repayment of debts due to their creditors, and secondly 'as a provision for their younger children. This would give a sti-'mulus and an energy to many a proprietor of lands that are strictly 'entailed, who possesses both a fine taste and public spirit, but looks 'at his younger children with a sigh, and complains that he cannot 'support his rank in life, and improve both the aspect and value of 'his estate, (or rather of that property of which he is the temporary 'possessor), without defrauding his creditors, or beggaring his young-'er children. It also would give great relief to such a man, when

'he

'he has in his youth contracted large debts in embellishing this pro-
'perty, and in his old age is seized with the deepest distress, when
'he thinks that he has made but little provision for his blooming
'daughters, while the family estate, by the will of the entailer, goes
'to an heir male, who may sometimes be only a distant relative.
'An act of Parliament, by which every heir of entail could burden
'his successor to the amount of the money which was thus expend-
'ed, would injure no person, and would be attended with many ad-
'vantages.

'The second thing necessary is. that when farmers have long
'leases, and plant such belts of wood, or make plantations on the
'barren parts of their farms, they should be valued at the expiration
'of their leases; and the tenant, at his removal, should be allowed at
'least a moiety of their value. During the currency of the lease, the
'farmer should also be at liberty to use what weedings he had occa-
'sion for, if he planted the wood himself. The reporter is happy
'to remark, that it was from seeing a regulation of this kind, in
'the articles of agreement between George Skene esq. of Skene,
'and Mr Robert Walker in Wester Fintray, that this sentiment first
'occurred to him, not as a matter of speculation, but as what had
'been actually practised; and he has been lately informed, that Mr
'Allardyce of Boyndsmill has planted wood to a considerable extent,
'in consequence of an article in his lease, by which his landlord is
'bound to pay the full value of all such wood at its expiration.'
pp. 382, 383.

Dr Keith had recommended, in his preliminary observations, (p. 10), the 'mixture of the plough and spade husbandry,' in the neighbourhood of great cities, as it is practised in the vicinity of Aberdeen, upon lands rented at from 5*l.* to 20*l. p.* acre; and stated the great expense at which these lands were brought into cultivation. Of the labour bestowed, some idea may be formed from this circumstance, that the granite raised upon an acre was sometimes sold at from 30*l.* to 50*l.* In the chapter on 'Improvements,' he resumes the subject, under the title of 'Trenching.' As it is impossible to do justice to our author by an abstract, and as this mode of improvement may not be understood in some other districts so well as in this county, though in several situations it may be adopted with advantage, a considerable part of the section shall be presented in his own words, after premising, that the author, alluding to the improvements of the proprietors of the county, and citizens and gardeners of Aberdeen, justly observes, 'it is not pretended that this pattern 'ought to be universally imitated.' Indeed, the present high price of labour must confine this expensive operation within very narrow limits, at least in so far as it can be executed by a farmer upon a lease of ordinary endurance.

'As

'As trenching has been practised to a greater extent in Aberdeenshire, than in any other county in Scotland, or perhaps in Great Britain; and as the ground is both more thoroughly improved, and a greater quantity of human food is raised by this, than by any other method; it is proper to state the different ways in which it is practised, as well as the peculiar advantages that attend the different methods of trenching.

'It is practised in barren land which abounds in stones of different dimensions; sometimes, where the soil is dry, and, in other cases, where it is wet—united with draining. It is practised when the object is to deepen the soil; or to mix a portion of the subsoil along with it. It is practised when the subsoil is tilly or very tenacious, as well as when that next the surface is unproductive, moory, or exhausted by over-cropping. And, lastly, it is practised when the land is foul, and when stronger or cleaner soil can be brought up to the surface.

'1. It is practised in barren land, which abounds in stones of different dimensions. Used for this purpose, it is the most complete method of rendering such land arable. In this case, the surface is cut into square or oblong pieces, and thrown in the bottom of the trench, except when forming the first trench, which of necessity is thrown on the barren land. The labourer cuts off a breadth generally of three feet, and throws out both soil and subsoil to the depth of about fourteen or fifteen inches, and as long as he finds it expedient. He throws all the stones on the surface, and generally requires *two stamps and two shealings*, as he terms it, to fill up his trench. The first stamp, or spit, dug by the spade, is about eight inches deep, if he be able to pierce so far into the ground. This is thrown into the open trench; then with a shovel or spade, he throws the loose earth above that spit; after which he digs a second spit, which he lays above the former, and uses the shovel or spade a second time, to level the bottom, and throw the earth, sand or clay, which he finds there, on the top of the trench. If these two spits and two gatherings by the shovel amount to the depth required, he goes backward, and shapes off another trench: if not, he must, in hard soil, dig a third spit, and then apply the shovel a third time. The stones are always picked out, and thrown on the surface.

But it often happens that the spade cannot pierce the stony ground. In this case, a kind of mattock, provincially termed a *pick*, is applied. By means of this, the stones and earth are loosened to the depth of several inches; and they are then thrown out with the spade: A second, third, and fourth picking are given, shealing the trench with the spade between every picking, till the requisite depth is obtained. Where the pick or mattock is not sufficient to raise some of the large stones, crows, or levers of iron, from three to five feet, are used; and wherever these fail, a long wooden lever, of several yards is applied. When no lever can re-

'move

'move them, the labourer digs around the stone, and loosens the 'earth; after which the boring irons are used; and then gunpowder 'poured into the hole, which is afterwards jammed in with bits of 'stone, is lighted by a match, and the stone is blown in pieces; by 'which it is broken into such fragments as can be raised out of the 'ground. The labourer is generally allowed a penny for every inch 'depth of this bore, independently of the expense of trenching.

'When the ground is wet, the labourer shows particular accuracy 'and dexterity in laying the bottom of the trench. The grassy sur-'face is most carefully laid on its back, and every sod or spit com-'pactly joined together, that the water may form a new *pan* or 'channel between the soil and subsoil. The bottom of the trench 'is cleared of all dirt or loose earth, and formed into a slope or le-'vel, with a small descent if possible for the water, before the sur-'face is inverted, or compactly laid on its back. It is the care used 'in scouring the bottom of the trench, and laying the inverted sur-'face flat in the bottom, and joining all the sods together, that ren-'ders trenching a permanent improvement in wet soils.

'If draining be necessary, as well as trenching, the drains are 'cut as much deeper than the bottom of the trench, as that the 'whole water contained in the drain shall be below the level of the 'bottom of the trench; and the breadth and depth of the drain are 'proportioned to the quantity of water;—only, a small part of the 'bottom of the trench is made to slope gently into the drain, that 'no water may remain among the grassy sods, but that the whole 'moisture may fall into the drain. Conducted in this manner, 'trenching has been found beneficial to wet soils; when the invert-'ed grassy substance has answered the purpose of filtering the mois-'ture, and carrying off the otherwise stagnant water.

'When the object is merely to deepen the soil, the ground in the 'subsoil is chiefly loosened by the pick or mattock, and then thrown 'by a spade above the spit of soil which was thrown into the bot-'tom of one trench, after being taken off the surface of another. 'By this means, the soil can be deepened to 16 or 18 inches, if ne-'cessary, where it was formerly only 5 or 6 inches deep. But in 'this case, it is necessary that the bottom of the trench be com-'pletely picked up, and that no interstices of hard subsoil be left 'between the trenches. For this purpose, the pick or mattock 'should take up the bottom by a perpendicular stroke; and the la-'bourer must *clean the teeth* of the trench, so as to prevent any space 'being left untouched or unloosened by the spade. Negligence here 'is very apt to break a plough; for, after trenching, when the soil 'is loose like that of a garden, the horses go on rapidly, and some-'what carelessly; so that when they meet with a sudden obstruction 'from an *ill-picked* trench, a broken plough is the first indication of a 'ridge in the bottom of it, which was left by an unskilful or disho-'nest labourer. When properly executed, as it generally is, the

'deepening

'deepening of the soil is a permanent improvement, that more than 'doubles the value of the land.

'It often happens that the soil and subsoil are of different quali- 'ties, and by trenching them they are mixed; and a better soil than 'either is produced by the mixture. The surface no doubt is turn- 'ed into the bottom; but by using the *shovel* twice in what are call- 'ed the *two shealings*, the soil and subsoil are considerably mixed; 'and in the course of two ploughings the mixture of the two is 'completed. Mixing of opposite soils is thus a great improvement.

'Trenching is also practised with great success, when the subsoil 'is tilly and very tenacious. It is very usual to have five or six 'inches deep of moory, black, unproductive soil, next the surface 'of our moors, and clay or till below this. When the moory soil 'is thrown into the subsoil of a trench, and a mixture of moor with 'the till in the bottom is laid on the top, the superabundant mois- 'ture is carried off, and the ground becomes dry and very pro- 'ductive.' p. 415—418.

In the chapter on 'Live Stock,' section 'Cattle,' the author gives a history of the cattle trade of the county,—an account of the different breeds,—and of the numbers consumed at home, and carried away to other places; which we believe will be perused with interest and advantage. On the present breed of the county, he observes,

'By carefully avoiding all crosses with the too large and long- 'legged breeds, which some of the proprietors had brought from 'England; and by raising well-shaped bulls at home, or purchas- 'ing them from Fife, the present largest breed of Aberdeenshire '(when five years old, weighing from five to seven cwt.—at seven 'years old, from seven to eight cwt.—and when full fed, from ten 'to twelve cwt.) was raised to great perfection.' p. 461.

From a view of the present state of the cattle trade, compared with what it was sixty, or only forty, years ago, which it is believed will be found in general correctly given, the Doctor hazards some predictions as to the future husbandry of the kingdom; of which our readers may form their own opinions from the following quotation.

'If the rent of land continues to increase, and improvements in 'agriculture to go on as rapidly as they have done for the last 30 'years, Aberdeenshire may become a corn country; and the rear- 'ing of black cattle for the market of England, may, in the course 'of a century, remove from the Pentland hills to the Pentland firth; 'and Caithness and Sutherland come in the place of Berwickshire 'and the Lothians. But when, in the progress of luxury, the feed- 'ing of cattle becomes of more value than the raising of corn, 'the cultivation of the soil by the plough will make a retrograde 'motion. The Lothians and Berwickshire will become graz- 'ing counties; and from Northumberland and Durham, to Kent

'and

'and Middlesex, the soil will be occupied by the grazier, instead of 'being cultivated by the farmer. May luxury never produce the 'effects in Britain which it did in imperial Rome!' p. 464.

It is with regret we observe the following remark on the distempers of horses. 'The writer of this Report has in general no 'great confidence in a science, where the *afflicted* animal, or *pa-'tient*, cannot *inform the doctor* what complaint he feels.' (p. 504.) Though the expression of this opinion is very cautious, if we consider it in connexion with what follows, respecting a carrier's horse who recovered in about six weeks, after having been '*turned out to the fields to die*,' and who, he adds, 'must in all 'probability have died, if one of those who pretend to be far-'riers had been employed to heal him,' it is but too apparent, the Doctor has *rather no confidence at all* in the veterinary art, or its professors. The author may justly, indeed, treat with diffidence, or even contempt, the *pretenders* to this art; but since he admits, that there are 'a few persons who follow the 'profession with *great success*,' why endeavour to discredit it, because the 'afflicted animal cannot inform the doctor what 'complaint he feels?' As '*great success*' has attended the practice of some farriers, the inability of the sufferer to complain, and, it might have been added, to take any measures for its relief, might have been expected to lead to a very different conclusion. From the present high price of horses, a few shillings might certainly have been worse spent, than in an attempt to preserve the life of this useful animal, instead of 'turning 'him out to the fields to die.' Upon the veterinary art, and its professors, we shall probably have it in our power, in next Number, to offer some observations, which it is hoped may excite the attention of our readers, and lead to a discussion of this very important subject.

In the chapter of Rural Economy, section—'Labour,' the author informs the public, that he had 'bestowed considerable 'attention to the most economical way of using all the different 'kinds of food in calamitous seasons; and, after trying a mul-'titude of experiments, he came to the following conclusions:' From these, it is believed, our readers may obtain information of much utility, especially to the lower classes.

'1st, That the most economical way of using bear or barley, is 'when it is ground on a barley mill, and boiled as pot barley, either 'with a little butter, and a few vegetables, (in which case it is pro-'vincially called *barefoot broth*), or with a bit of meat, where this 'can be had, or with milk, when it is called *milk broth*. A boll of 'this kind of corn, made into pot barley, and boiled for three hours 'every day, will go as far in nourishing persons who are not hard 'wrought,

'wrought, (*i. e.* sedentary persons, women and children) as *three* 'bolls made into meal, or *six bolls malted*, and *brewed into ale.*

'2d, That the most economical method of using oats, is to make 'them into meal, and mix them along with milk, slowly and long 'boiled. This is called milk-porridge, and is allowed to stand some 'time to cool before it is eaten. It is not so proper to make them 'into brose, except for persons who are at hard work; and even 'then, though made hastily, the dish should be *cool*, not cold, be-'fore it is eaten. When the oats are injured by a rainy season, 'an ounce of rice mixed in a pound of oat meal, will have a great 'effect in rendering them both more palatable and more wholesome 'food.

'3d, That in such times of scarcity, (and indeed at all times 'when it can conveniently be done) no oats should be given to *horses* 'till they are ground, or at least bruised.—Two pecks of ground or 'bruised oats are nearly as valuable as three pecks given in the 'common way. They are more thoroughly digested, and go more 'directly to the nourishment of the animal.

'4th, That after the bones of butcher meat *appear* to have yielded 'all the juice that can be extracted by boiling water and pot barley, 'the *more penetrating liquid*, in which *coleworts are boiled*, has the 'effect of extracting still more nourishment to the poor cottager, 'who by this *only process known to him*, obtains all the *nourishment* 'that *he* can be supposed to extract from *a shin of beef*, the *only* 'part of an ox, to which his light purse can extend in years of 'scarcity.

'5th, That butcher meat should be *boiled* with pot barley and 'other vegetables, even by the opulent, in such calamitous seasons, 'and not *roasted* in any considerable quantity, as this is a great 'waste of provisions. Baking into puddings or pies, with flour or 'other articles, is not liable to this objection;—though there is most 'frugality in pot barley, and boiled meat.

'It has been stated, on the authority of Sir JOHN PRINGLE, that 'a *pound of butcher meat* contains as much nourishment as is given 'by *twelve pounds of bread.* The Writer of this Report entertains 'great doubt of the truth of this assertion.—But he has no doubt 'that one hundred weight of beef, worth 9d. per pound,

'or - - - - - - - - -	L.4	4	0
'With pot barley, potatoes, and turnips, worth only -	1	1	0
'And with either household, wheaten, or even oaten 'bread, worth - - - - - - -	1	1	0
'All amounting only to - -	L.6	6	0

'will go as far in supporting a family with nourishing food, as '*four times* that sum expended on roast beef, and fine flour, in years 'of scarcity. And he is also of opinion, that in the country, where 'milk can be had in abundance, the farmer's servants, and the cot-'tager's family can be supported at one-half of the expense, even of

'*boiled*

'*boiled meat*, where pot barley, oatmeal, and potatoes, are used with '*milk*, and a proportion of *rice* where the oats have been damaged. 'He can speak here from the experience of his own family, and that 'of many other families in his neighbourhood, in five different years 'of scarcity, viz. in 1783, and 1784, (in consequence of the bad 'season of 1782, and bad seed of 1783,) and in 1796, (in conse-'quence of a bad crop in England in 1795,) and of 1800 and 1801, 'in consequence of the bad season of 1799, and of bad seed in '1800.' p. 518—520.

We present the following observations without any comment.

'The rise both of the *money*, and of the *real price of labour*, has 'been very great since 1782, when the turnip husbandry began to 'be generally studied. Previous to that period, a farm servant's 'wages seldom exceeded L.4 yearly, besides his victuals. Now they 'are at least four times as much, or L.16 a year, often L.18, and 'sometimes L.20. A day labourer, who got no food from his em-'ployer, did not earn above 5s. a week, where now he has 12s. At that 'time he was supposed to have high wages, if he earned the price of 'a peck of meal daily, even at building stone fences. Now he earns 'at least the price of a peck and a half of meal at that profitable 'employment. The rise in the *money* price of labour is therefore as '*five* to *two*; and the rise in its *real* price, is as *three* to *two*. The 'decrease of the value of money within 28 years is consequently as 'five to three; and the rise in the real price of labour, which is as 'three to two, is a proof of our increasing industry, and of the na-'tional prosperity, in spite of wars and taxes.' p. 522.

To ameliorate the condition of rural labourers must be the wish of every benevolent mind; and several different plans have been suggested, and adopted with more or less success. It has been a matter of complaint, that after a considerable sacrifice on the part of the higher classes, this object, in many cases, has not been effected; and it is not uncommon to hear them declaim against the stupidity and ingratitude of their inferiors, when the blame, at least in part, ought to be applied to their own mistaken, though well intended, measures. An ignorant country labourer is indeed no good judge of the advantages that may be expected to result from any methods adopted by his superiors to improve his condition; but he is sufficiently capable of estimating the result, and cannot but know and *feel* whether or not these measures have produced the desired effect. Though we give the author full credit for the benevolence of his intentions, we are by no means sure that his opinions on this subject are quite correct. In our minds, the idea of a farm servant can never associate with that of a man who possesses even a few acres of land. From the observations we have made in counties where this practice is partially adopted; and on comparing the condition

tion of such men with that of the peasantry in others, who are allowed land for potatoes and vegetables only, and have a cow kept through the year by their master, we are convinced that no benefit, but the reverse, will be conferred upon farm servants by such a measure. But, that the Doctor may be heard for himself, we select the following extract, from many others of a similar nature, with this remark, that a 'family of children' would be much more profitably employed, both for themselves and their master, in hoeing turnips, gathering weeds, picking up small stones from the hay fields, and assisting in hay harvest, than in 'caring for a cow, or even two cows, either in summer 'or winter.' Besides, there is an obvious inconsistency in complaining that the 'employing women' (and he might have added children above eight or ten years of age) 'to hoe tur-'nips, and to gather the stones and weeds off the turnip fields, 'has as yet by no means become general,' (p. 520), and, in the space of three pages more, recommending a measure utterly incompatible with such employment.

'Many of the better sort of farmers have one married servant, 'with a *cottage*, and a small garden, or *kail yard*. Some of these 'keep *a cow* round the year to such a person, who is generally pre-'ferred, as being more steady and attentive than the younger, or 'unmarried servants are. This method is certainly preferable, in '*most cases*, to giving a few acres of ground to a married servant, as 'it leaves him, and his wife and children, free of attending to a 'single cow, whose milk is not worth the expense of attending to 'her alone. But others, who have *detached* pieces of *broken ground*, 'give two or three acres to a faithful servant; who has a family of 'children, that can care for his cow, and occasionally for two cows 'in summer, and only one in winter. As long as the ground that 'is in cultivation, *is ploughed by the farmer*, it will often be prudent 'thus to accommodate *one* married servant; and the extent of his 'small croft must be determined by the quality and situation of the 'ground, and other circumstances. No general rule can be laid 'down for cases of expediency.' p. 523.

We have hitherto avoided expressing any opinion on the Doctor's calculations, because we conceive this part of the county Reports of little general importance. They must be in a great measure regulated by principles of local application, even though made with the greatest accuracy. That we may not, however, incur censure on account of this omission, we offer the following specimen.

'By looking back to the expense of labour in the farm of Wester 'Fintray' (*Ecce, iterum Crispinus!*) 'in page 204, it appears that 'the charge on 276 Scotch or 350 English acres, for labour, 'amounts to L.480, viz.

' To 4 married servants, for board and wages - -	L.100
' 7 unmarried men, and 4 women servants, for wages	130
' Articles of provision for ditto - - - -	80
' Labourers, and implements of husbandry - -	170
' Total for labour, or labourers, and for implements	L.480

' This is above 27s. per English, and nearly 35s. per Scotch acre. ' But when land is rough, with a considerable declivity, so that two ' horses or two oxen cannot easily plough it, the expense of labour ' may be stated at a guinea and a half per English, or L.2 per ' Scotch acre.' p. 524.

Such of our readers as choose to look back to the page referred to, will find the following *item*, which is included in the passage above quoted.

' Articles of provision for *his family* and unmarried			
' servants, *not raised on the farm* - -	L.80	0	0
And the following articles, which are *not* included.			
' Annual loss on the wear of his horses -	L.30	0	0
' Incidents - - - - - - -	20	0	0

Our intelligent readers certainly will not think it necessary that we should occupy their time with any observations on this calculation of the expense of labour.

The importance of the subject will plead our excuse for the following long extract from the chapter ' On political economy,' section, ' The Poor ; ' and, should it be perused by those who have it in their power to redress the grievances so justly complained of, we humbly hope that the measures necessary for that purpose will engage their early attention.

' Under the head of *Poor's Rates*, it was mentioned, that partly ' by *an oversight in the Property Tax Act*, and partly by the inter- ' pretation put upon that law by the *Commissioners for Special Pur- ' poses in London, the poor's funds in Scotland have been taxed—cer- ' tainly without any intention on the part of the Legislature.* As the ' Writer of this Report has applied, in vain, for redress, is becomes ' necessary to state the particulars.

' 1. Owing to our distance from London, and the small capitals ' of our *Church Sessions* being insufficient for the purchase of stock ' in the public funds, the money belonging to the poor of the differ- ' ent parishes, is generally lent out, either on bills or bonds. From ' the ignorance of the framers of the Property Tax Act, or from ' their not attending to this circumstance, a clause, exempting from ' this tax, the interests, or annualrents of poor's money lent on such ' security, was neglected to be inserted in 1807. The present Chan- ' cellor of the Exchequer, on being informed of this, acknowledged, in ' a very humane and condescending letter, that " this was an omis- " sion in the Act of Parliament, and that all interests of money be- " longing to the poor, in whatever way it was lent, ought to have " been

" been exempted from taxation." Three years and a half have elapsed since this acknowledgment was made; yet, owing to the pressure of public business, the matter has been forgotten. It is therefore necessary to put it in the view of the public; and it is hoped, that, in the next property act, the exemption will be inserted in the clearest and most comprehensive language.

'2. When a Church Session has as much money, either by any legacy, or by savings in years of plenty, they sometimes purchase a rood or two, sometimes an acre of land, or a small house in any town in their neighbourhood, the rents of which are applied to the supplying of the enrolled poor of the parish. But owing to the Commissioners for Special Purposes, under the Property Tax Act, being Englishmen, who reside in London, and are unacquainted with the institutions of Scotland, they have refused to exempt from this tax the rents of different small parcels of land belonging to the church sessions of this county. The writer of this report, and other three of his brethren, claimed an exemption from the Property Tax, in favour of some small patches of land belonging to the poor of their respective parishes, and situated in the burgh of Inverury. To obtain this exemption, the reporter, and the rev. Robert Lessel, minister of Inverury, made separate affidavits, that the rents of these two small properties belonged to the poor of their parishes, and were applied solely for their support. When these affidavits were given in at Aberdeen, it was objected that they had been made in the country, before two Justices of the Peace, and not in that city, before the Commissioners of the Property Tax. To obviate this, the affidavits were made a second time before the commissioners, as required, and according to a particular printed form, the blanks of which were filled up by the claimants when they signed the affidavits. They were then delivered to Mr William Dingwall Fordyce, clerk to the commissioners, who behaved in the most obliging manner, and transmitted them to Henry MacKenzie esq. Comptroller of Taxes, Edinburgh. He sent them to the Special Commissioners under the Property Act in London, who alone have power to grant the exemption.

'After waiting several months, a return came from the Special Commissioners, who, in direct opposition to the 62d section of the *Property Tax Act*, refused to grant the exemptions claimed. On a different application from the *Church Treasurer* of the parish of Belhelvie, whose lands, belonging to the poor, are also situated in the burgh of Inverury, they also refused an exemption from the property tax; and on a second representation from that parish, they insisted, that the church treasurer should show, that the rents of the burgh roods belonging to the poor, were not applied to the lessening of any poor's rate, or parochial assessment. Surely the *poor's funds* in Scotland are not *to be taxed*, because we have no *poor's rates*, or as an equivalent for the poor's rates of England. But if this ought to be so, the Commissioners for Special Purposes

were

'were not Legislators; they held their office under an act, which 'expressly exempted all charity lands, whether in England or in 'Scotland, whose rents were applied to charitable purposes. If the 'Scotch Barons of Exchequer, or any set of Commissioners, who 'knew the institutions of Scotland, had been appointed to judge these 'claims, they would have sustained them immediately: And if the 'Special Commissioners in London had considered, that the *affida-vits* were made according to *their own printed form*, they were bound 'to grant the exemption, unless they believed that the claimants 'were guilty of perjury.

'3. When, owing to the necessities of the poor of their parish, a 'church session disposes of any property belonging to them, this 'must be done by *public auction*, to prevent fraud, or remove all 'suspicion of improper conduct. Yet, in this case, both the auction 'duty, and the stamp duty, on the transfer of property, must be 'paid by those trustees for the poor in Scotland, though neither of 'these is paid by the church-wardens of England. The writer of 'this report, and the other members of his church session, owing to 'the decline of the stocking manufacture, which was the chief sup-'port of the women, who reside in cottages, were induced to sell 'the land in Inverury, on which they had illegally been obliged to 'pay the property tax. It was sold for 151*l.* (which was at the rate 'of 100*l.* per English, or 127*l.* for the Scotch acre.) The auction 'duty amounted to *four pounds eight shillings* and *one penny*, and the 'tax on the stamped paper to *thirty shillings*: So that this small 'property, belonging to the poor, paid 10 per cent. annually while 'they possessed it, and nearly 4 per cent. of its total amount, when, 'from the decline of our staple manufacture, it was sold by auction. 'The writer of this report applied to the Scotch Commissioners of 'Excise to obtain redress as to the auction duty; but received for 'answer, that "no relief from duties could be given; that the Board "have no power of dispensing with duties; that no exemption was "given by law for sales for the benefit of the poor; and that it was "out of the power of the Commissioners to give up the duty in this "case, however much they regretted it."

'The reporter should not have had the approbation of his own 'mind, if he had neglected to lay these statements before the public. 'If the matter had personally regarded himself, he should have 'thought it improper to have introduced it into this work; but as 'it respects the poor, not only of his parish, but of all the parishes 'in Scotland, and as in this section he was bound to state any facts 'that regarded the poor, he considers that his silence would have 'been criminal.' pp. 598–602.

Similar reasons with those which induced us to direct the attention of our readers to the last extract, may be assigned for the insertion of the following one, which the Doctor has very appropriately connected with his observations on *slugs*, *rats*, &c. in the section on the *Enemies of the Farmer*.

'Another vexatious circumstance merits attention. This is a tax 'upon horses, by persons who possess lands above 10*l.* of rent. 'This is not imposed upon the smallest farmer in England who 'does not pay 20*l.* of rent; and as the English farmer pays tithe, 'land-tax, and poor's rates, a farm of 20*l.* rent in England is gene-'rally equal to one of 35*l.* in Scotland. When a farmer in England 'pays the property tax on one half of his rent, the Scotch farmer, 'whose rent to the proprietor is much higher, ought seldom to pay 'above two-sevenths, in order to be exactly in the same situation 'with the English farmer. No favour is here asked—justice only is 'required by the Scotch farmers, especially by such of the small ones, 'as, in many places, are poorer than the day-labourers.' p. 615.

We must now take leave of the Reverend Author, with the expression of our earnest wishes, that this work, as well as his other labours for the benefit of his country, may be followed by those happy results, which the benevolence of his intentions, and his indefatigable industry, deserve, and may be expected to produce. Durst we venture to hazard advice, or rather to suggest what appears an improvement, we would recommend one trifling circumstance to the attention of the Reporters, which would render the benefit of their labours more accessible, both in point of time and expense, to a great many farmers—we mean *the Art of Compression.* We have already given our opinion of the general merits of this Report, and have ventured, on some subjects, to dissent from the author; but if, in any instance, we have misunderstood him, or (if he shall so conceive) misrepresented his statements, though he may be assured not intentionally, justice shall be done to him in a future Number, if he shall be pleased to favour us with his observations. In the words of our author, 'It is a false pride which prevents a man from ac-'knowledging where he is in the wrong.'

BRANCH

BRANCH III.

AGRICULTURAL INTELLIGENCE.

THE last three months must be considered as having been favourable to the farmer, both in reference to the prices obtained for his grain and live stock, and the facilities afforded him by the mildness of the weather in executing the labours of the season. Our Reporters, with only one or two exceptions, agree in representing, that a few days of dry weather will enable farmers, in almost every situation, to commence sowing, as ploughing is in an unusually advanced state. In one northern county (Inverness), that important operation was begun some time since, and is probably now completed, so far as regards Oats, as well as Beans and Peas. The mildness of the weather has been of great advantage in saving fodder, which, if the winter had been of an opposite character, must, at this period, have been nearly all consumed. Cattle and sheep have obtained the full benefit of the Turnip crop, which has experienced much less injury than in ordinary seasons. The appearance of the young Wheats, with the exception of some fields which were sown under the most unfavourable circumstances, and at too late a period of the season, is healthy and vigorous. The Clover fields are, in general, fully planted; and the Pastures have all along retained a considerable portion of their autumnal verdure.

Though the deficiency of last crop, with the exception of Oats, is now fully ascertained to be very considerable; and though the quality of the grain, in many instances, was injured by the wetness of the harvest months, prices have not, until very lately, experienced any considerable advance, in the course of the last three months: But it is to be observed, that they might be considered as rather high at the commencement of that period. The principal reasons of this are, we believe, correctly stated by our intelligent Reporters to be, that the inferior quantity and quality of the fodder, as well as the necessity of thrashing a larger portion of it, to obtain the quantity of grain required to meet the usual pecuniary demands of the cultivator, have forced into the market a much greater proportion of the crop than is commonly disposed of during the winter months. The stack-yards are, in consequence, much thinner than they generally are at this period; and the probability therefore is, that the deficiency of last crop will be more severely felt in the summer months, unless a considerable supply can be obtained from foreign parts; of which, at this time, no one can form sanguine expectations.

Cattle, through the whole winter, have been in demand; and such as are already disposed of, have left a fair profit, whether in a condition for the butcher, or for grazing. The same observation is applicable to sheep fed on turnip. But we are sorry to observe, from

our English Reports, that the rot, in some situations, has prevailed to an alarming extent among this valuable species of live stock. This dreadful distemper does not seem, as far as appears from the Reports, to have been so destructive in this part of the Island; but it cannot well be ascertained, for some weeks, that they have entirely escaped the ravages of a disorder which is too frequently the consequence of a wet autumn, succeeded by an open and moist winter. It is sincerely wished, that our fears on this head may be groundless. The only description of live stock, which has not brought such prices as will remunerate the feeder, is Swine; and this is usually the case when grain is dear, and potatoes not remarkably abundant. As a corn farmer, however, can always subsist a few of these animals without almost any additional expense, it will be for his interest, even at the present low prices, to pay some attention to these victims of ignorance and prejudice. To such farmers, we beg leave to recommend the perusal of Mr Henderson's Treatise on the subject.

An Act for suspending Distillation from Grain is now passed as almost a matter of course, upon every real or imagined necessity; and the subject having been discussed at different periods, at much length, in the speeches of the Members of the House of Commons, and in this and other publications; it is unnecessary, at this time, to enter upon an examination of the expediency, the policy, and the consequences of the late enactment. It may, however, be observed, that it operates precisely as a tax upon *one class* of society, by which the whole community is benefited. That nothing but a very obvious and urgent necessity can justify a measure which takes a sum out of the pockets of farmers, for the benefit—not of the poor and labouring classes exclusively, for they only participate in it with the most affluent. If justice and humanity require that the price of grain to the lower classes should not exceed a certain amount, proportioned to their means of purchasing; and if prices must be maintained at this level, by a sacrifice on the part of the higher ranks, we have no doubt that farmers would cheerfully contribute their just proportion of the burden. But it is not consistent, either with justice or humanity, that the farmer alone, though often struggling under almost unsurmountable difficulties, especially at the commencement of a lease, should be compelled to dispose of his produce, to the rich as well as the poor, at a price at which he cannot afford it; and thus be subjected to a heavy contribution, from which all other orders of society are not only exempted, but, in fact, derive a considerable advantage. There is not a man acquainted with practical agriculture who will deny, that even a high price—a price much above the average of ordinary years, for what the farmer has to sell of a deficient crop, does not often reimburse him for the diminished quantity of his disposeable produce. None but the most ignorant and prejudiced will contend, that the ratio of the advance of price ought not to exceed the ratio of the deficiency of the *gross* produce. But if the principle adopted and acted on by our Ministry is just, it must be assumed as indisputable, that the farmer obtains exorbitant profits when his *disposeable* produce advances above a certain price, or rather such a

price as may be thought too high for labourers or artificers to pay. We do not allude to the extreme case, when there is a probable danger of famine; but we must beg leave to repeat, that the interests of farmers are, in general, totally disregarded; that even a considerable advance of price, when the crop is very deficient, however severely it may be felt by some of the lower ranks, is not a good reason for compelling the farmer to sell his produce below the price he would otherwise obtain, which, by limiting the demand, is the effect of a prohibition of the use of grain in the Distilleries, unless it can be shown that his profits would otherwise be exorbitant. We need scarcely add, what is well known to such as have paid attention to the subject, that, in a year when his crop is greatly deficient, the farmer is the first, and, in general, the greatest sufferer. There is reason to believe, from various circumstances, which it is unnecessary at present to enumerate, that this temporary measure, so often resorted to, will, at no distant period, be converted into a permanent one, at least, when corn is above, and sugar below, a certain price; and we think it our duty to put our readers on their guard, and to request them to keep this probability, as well as the property-tax in view, in offering rents upon new leases.

SCOTLAND.

Aberdeenshire Quarterly Report.

The winter has hitherto continued open, and favourable to agricultural purposes of every kind, without any long continuance of frost, or deepness of snow; so that labouring and field work of every description is more forward than it generally is at this early period.

The stack-yards of last year's crop were not of the usual size; and the dampness of a great proportion of the straw rendered it unfit to be kept; so that, besides part of it being totally lost for the use of cattle, the remainder not having the usual service, will bring the disposeable part of the grain much earlier to market than it is in general.

Corn stacks have turned out very productive under the flail; and the quality of the grain sufficiently fine, although that part which stood long under the rain in harvest is much discoloured, and unfit for shipping. Taking the old stock (which will be found necessary) along with the present crop, there will be as much grain spared for the foreign markets from this county, as a full average crop would have afforded.

In the months of October and November, when the price of grain started considerably, Oatmeal sold for from 19s. to 22s. per boll; Oats 19s. to 24s.; and Bear 25s. to 33s. There has not since been great variation on these prices; and it may be added, that a greater quantity of grain has gone into the hands of merchants during the last three months, than during an equal period in any former year. The price of Cattle and Sheep continue much as formerly. Beef 9s. 6d. to 10s. 6d. per stone, sinking offal;—in the Aberdeen market 7d. to 9d. per lib. Amsterdam. The stock of winter-fed cattle is not thought to be so great as usual, many preferring rearing

them, and putting them in condition for the Southern markets in spring and summer.—*20th Feb.*

Upper Annandale Quarterly Report.

A MILD and rather open winter has been favourable to stocks; and though rains occasionally impeded the plough, tillage is considerably advanced. *Sheep* are in excellent order, and there is no fear of a demand. *Cattle* have been easier maintained than was expected; for, though the straw failed exceedingly in last crop, the hay was abundant, and the pastures good; and the turnip crop has met with little check or loss. *Grain* has maintained a more equable price than was looked for; and excepting wheat, none of it has risen so high as was expected. *Wool* has greatly disappointed the storemaster, having fallen above 30 *per cent.* below the prices of last year; and these have been very ill paid, and with heavy discounts, or serious delay and loss.

Rents of land have scarcely met with any stop in their advances in this county; and, with *taxes* and *labour*, they continue to rise. Increasing *skill* and *prices*, however, in some degree advance also, but not with equal pace. *Artificial manures* tending to maintain fertility in the soil, and open and free markets for the produce, with a *population* increasing much, and adding considerably both to the *demands for produce*, and to the *labour* necessary to prepare it,—furnish considerations encouraging to the farmer, and important in the view of the landholder and the legislator.

Larger *capitals* and *credit* than such as answered before, are now absolutely necessary to success in farming: and the profession requiring large *investments*, in order to occupy well—together with suitable *accommodations* in buildings and fences, and encouragement in the *tenure* of possessions—the whole art of agriculture is rising, and must continue to advance in esteem and importance.—*Feb. 29.*

Extract of a Letter from Ayrshire, March 5.

'The general character of the preceding quarter has been wet and stormy in the extreme, with very short intervals of frost. The same description of weather still continues, so that the ground is completely drenched; and, except on old leas, little ploughing has been got executed, at least to any good purpose. The immediate evil arising from this long-continued wetness, must be a late seed-time; which is not desireable at any time, and more especially this season, when there is yet a considerable quantity of wheat to sow, which could not be got sown at the proper time, owing to the unfavourable weather towards the conclusion of harvest. Such of the wheat as was sown at the usual time upon dry ground, is looking well; but almost all of it on strong heavy land is looking sickly, and not a little has been covered with water, and irretrievably lost. It seldom happens that so much wheat has to be sown at this season of the year. The state of the stackyards, which are more empty than usual at this season, is beginning to discover the sad effects of the last unfavourable harvest. From the great quantity of damaged grain at that time, and which behoved to be thrashed out as soon as possible, the markets continued full, and the prices pretty sta-

tionary during the winter; but that glut being now removed, an advance in price, as well as demand, is daily taking place. Indeed, whether it be owing to the unfavourable state of the weather, to the real deficiency of last crop, or to any apprehension that our differences with America will not be soon amicably settled,—whether it proceeds from all or any one of those causes, it is certain that the demand for grain of late has become very brisk, and the prices, of course, must be expected to advance. The county fiars, which are considered as the criterion of the average prices, were struck towards the end of February; and though considerably high, yet if they had been delayed till the usual time, about the middle of March, in all probability the prices would have been much higher. The meal market is still considered as our barometer for ascertaining the state of grain; and in the last Ayr Journal, it was stated to be 1s. 10d. the peck by retail. The Wheat, by the fiars, is fixed at 2*l.* 2s.; but, since that, it has been bought at 47s. and upwards, the boll of 4 bushels. Barley is 45s. the boll of 8 bushels. Common Oats are rated at 30s. the same boll; and the potatoe sort are 3 or 4s. dearer. The price of Potatoes has remained pretty uniform through the season, at 1s. the peck by retail. High as these prices are, it is conjectured they will do very little more than indemnify the farmer for the great losses sustained by the deficiency, and the damage which the last unfavourable harvest occasioned. From the same cause, too, the price of hay also has of late advanced considerably.

'The cattle market, which sustained a great damp at the close of last season, has of late become very brisk; and the prices are such as the graziers are satisfied with. Since the introduction of still-feeding, the home market is regularly supplied; and the price of meat in the shambles is abundantly high. Upon the whole, considering the present state of the ground, farmers look forward with anxiety to the change of weather usually expected in the month of March; as the success of the future crop materially depends upon having a dry seed-time.'

Dumfriesshire Quarterly Report.

The crop of last year was certainly not so deficient as was supposed in the end of the autumn. The quality, upon trial, proves good; which had the effect of lowering the prices for some time; and kept them in such a state of moderation, as ought not, it would seem, to be complained of by the farmer or manufacturer. Prices are now a little quickened. Wheat 11s. 6d.; Barley 5s. 3d.; Oats, best quality, 4s. per Winchester bushel; Oat Meal 3s. per stone.

These may be considered fair rates by all classes of society. Neither should wish to take advantages of the other. When such are taken, by means of speculation and unfounded alarms, it may, for a time, raise the price of corn beyond the fair rate of it, and frequently proves distressing to trades' and labouring people; which, as has often been the case, becomes ultimately hurtful to those who were the cause of it. Hence the failures in great speculations in corn—the rents of 7*l.* and 8*l.* an acre for farms—the high

wages and expense of farm labour, which are at present but too likely to effect a crisis hurtful in the extreme to all who are more immediately interested in the agricultural pursuits of the country.

Wheat sown in September, and early in October, appears extremely well and healthy; but the wetness of the winter and spring has prevented many from sowing so much as they intended. The labour of the plough, however, is forward on dry lands; and, if the weather in March proves favourable, a great part of the oatseed will be early got in.

The turnip crop has stood the winter well, and is now, even the common kind, a fresh feed. The Swedish turnips are always so. The latter are on the increase; and when the qualities of them are more generally known, not alone for the security of them in March and April, but also for feeding of horses, there seems no doubt but they will increase still more. They are generally as useful and nourishing as potatoes, when steamed.

The season has been favourable for stocks of sheep. They are now considered in good order; and ewes for lambing are about to go for Yorkshire. Cattle in condition, of three and four years old, are also going off for the South, at good prices, and are leaving the farmer a fair, though moderate return. This, however, is a critical time for the dealer. Should the season set in frosty, or even very dry, in the course of two, or three, or even four weeks, before he sells, his expense of keeping is great, and his loss too certain.

Improvements continue in this county. A considerable extent is yearly added to the work of the plough, begun mostly by the operation of paring and burning; which is the speediest and most effectual method of bringing moor grounds, upon clay and strong soils, into a state of cultivation; though fallowing seems the best adapted for the light moss and gravel grounds.

Beef and mutton in the markets are at the moderate rates of from 6d. to 7d. per lib. Pork, of which such large quantities are brought to market in carcase in this county, has disappointed the feeder. It has brought only from 5s. to 6s. the stone of 14 lib. At Dumfries, the stone is 16 lib.; but the price is not more than for 14 lib. nearer the Border. This is owing to the longer practice and skill in feeding of the latter district.——19*th Feb.*

Forfarshire Quarterly Report.

The winter quarter has passed over without any severe storm; but there have been frequent falls of rain, which, in some degree, have washed and injured the ploughed land. Field labour, on the whole, is however well forward; but there is, as yet, little prospect of an early seed-time, the ground at present being covered with snow.

The grain crops of last year turn out indifferently as to bolls, though the sales have been by no means dull; and there is not now a large quantity to bring to market. Good wheat has brought about 50s.; Barley 30s. to 40s.; Oats 22s. to 28s. per boll.

Turnips have stood the frost tolerably well; and the profits of feeding have been better than last year. There is also a demand for winter-

ing cattle to the Engliſh markets, at good prices, at this early period. The autumn ſown wheat looks well on true wheat ſoils; but, on black and mooriſh land, is likely to throw out conſiderably with the ſpring froſts.

The high prices for cattle and grain have had the effect of keeping up the rent of land; and few farms remain long in the market. The offerers are not, however, ſo numerous as two years ago.——3. *March.*

Letter from Glasgow, 2d March.

'SINCE our last letter of intelligence, the weather has been unfavourable for field operations; but, though out-door work has not been done to any conſiderable extent, much has been done within doors. There is perhaps leſs grain to thraſh juſt now, than there has been at this ſeaſon for ſeveral years. Hence our markets have been kept full throughout the winter, and prices have been moderate; but, unleſs a very extenſive importation take place ſoon, it is probable that the prices of every kind of grain will experience a conſiderable advance. The young wheats, conſidering the wetneſs which prevailed through the whole time of their ſowing, have a better appearance than the weather gave reaſon to expect; and, what of that grain is above ground, ſeems to have abundance of root, and is of a very healthy appearance;—there is leſs of it thrown out this ſeaſon than uſual. The ſowing of ſpring corn has not yet commenced; and we are afraid that the wet weather of late, will prevent its being done for ſome time.

'OUR importations of oats have been conſiderable;—not leſs than 35,000 bolls of that grain have been brought to this market ſince our laſt Report. But the importations of wheat have not been ſo great, not more than 7000 bolls. Theſe imports have been chiefly from Ireland, Liverpool, and the ſouth of Scotland. Beſides theſe, we have had a great quantity of oats, wheat and barley, with our uſual ſupply of beans and peas from England, and the north and eaſt of Scotland; but, as the grain that comes that way is for the moſt part reſhipped at Grangemouth, the quantity cannot be correctly aſcertained. Annexed are the preſent prices in the Glaſgow market.

'State of Glaſgow Markets, March 2.

Wheat	Dantzic,	60s. — 63s.	p. 240 lib.
———	Foreign Red,	52s. — 56s.	
———	Scotch (new)	48s. — 54s.	
———	Ditto (old)	54s. — 56s.	
———	Engliſh (old)	54s. — 58s.	
———	American	54s. — 63s.	
———	Iriſh	48s. — 52s.	
Oats,	Iriſh mealing	30s. — 32s.	
———	Ditto inferior	26s. — 29s.	
———	Scotch potato	28s. — 32s.	
———	Ditto ſmall	26s. — 28s.	
———	Engliſh potato	32s. — 36s.	
———	Ditto ſmall	None	

Barley, English,	42s. — 46s.	p. 20 stones English
——— Scotch,	34s. — 40s.	
——— Irish,	38s. — 40s.	
Beans, English,	None	
——— Scotch,	32s. — 34s.	
Grey peas	33s. — 35s.	
Oatmeal, Scotch	28s. — 29s.	
——— Irish	25s. — 26s.	
Fine flour	88s. — 90s.	

Extract of a Letter from Inverness, 5th March.

'The winter has been uncommonly mild, with very little snow. Indeed, with the exception of a slight fall the second night of the year, we have had no snow worth notice; and I suppose there has not been fourteen days, during the whole winter and spring, that stopped the ploughs, either by frost or rain; consequently, field-labour never was more forward. Bean sowing commenced in the beginning of last month; and some farmers have already sown all their oats. From the first of October, to the present time, there has not been a week in which wheat, beans and peas, or oats, have not been sown in this neighbourhood. The autumn sown wheat looks well, being sufficiently planted. Turnips have suffered little. The yellow variety is all perfectly sound; and, after five years' experience on a pretty extensive scale, I can with confidence say, they are a great acquisition to the farmer, neither requiring earlier sowing, nor a greater quantity of manure than the common sorts. Fat cattle and sheep are making a decent return; and I hope lean stock will turn out a better concern than last spring. Wheat was in brisk demand two months ago, and nearly all bought up at 45s. per boll. Barley has been dull sale at 35s. to 40s.; and Oats at 27s. to 28s. per boll of five firlots. Hay 1s. per stone. Beef and Mutton, 6d. to 8d. per lib. Oatmeal 28s. per boll of nine stone. The Caledonian canal being nearly all finished at this end, the operations are now chiefly carrying on at Fort Augustus.'

Kincardineshire Quarterly Report.

The fine open weather, which prevailed at the date of last report, continued till about the beginning of December; at which period, a week or so of very tempestuous weather ensuing, announced the approach of winter. During the latter part of that month, and the greater part of January, there was almost one continued series of frost, although by no means severe; and as there has been comparatively little snow, the carting out of dung, the pulling and drawing home turnip, the carrying grain to market, and other necessary operations, were got executed in the most favourable manner. As a proof of the long continued openness of the season, the turnip foliage remained unimpaired until 21st December. Towards the close of last month, the weather became more unsteady, and a succession of very copious rains then happening to fall, put both the fields and roads, for eight or ten days, into a disagreeable state. This, however, was not in that degree as to retard out-work; therefore lea ploughing is generally well advanced.

Autumn-sown wheats got into a fine strong braird, and have all along retained a very healthy appearance; but the period considered as that of their severest struggle is not yet arrived. Turnips have stood the winter well, and afforded a good deal of eating; and cattle everywhere are in fine thriving condition. In the market, their price has continued with little variation during the quarter. This, however, has not been the case with regard to our corn market. Upon the orders being issued from the Privy Council concerning distillation, prices, especially in the article of barley, lowered precipitately eight or ten shillings per boll. Wheat has remained with little fluctuation; Oats experienced a decline of 20 *per cent.* Of late, there has been an increased demand; consequently prices are again on the advance. Oats turn out tolerably well, both in the barn and mill; the potatoe variety yielding from sixteen to seventeen, and common ditto much about fifteen, pecks of meal per Angus boll. Should the spring months prove severe, fodder, in a good many situations, is to be a scarce article, not affording near the usual proportion of consumpt; which is attributed chiefly to the damage sustained from the rains in autumn. But, taking the county as a whole, I should think there may be a sufficiency of it until the grass season.

At our Martinmas hiring markets, servants' wages were considerably lower; and never, in my recollection, did there appear such a disproportion betwixt farmers and servants, particularly young lads under the denomination of Ploughmen. Indeed, many of this description, after having attended the market for two, and even three days, returned unasked to engage.

It was noticed in a former report, that, in this district, land rent appeared to be almost stationary. Since that period, there have occurred some instances of farms, which were taken a few years ago, being given up as a losing concern; and the judicious proprietors, rather than run the hazard of a change of tenants, have granted a renewal of bargain at a reduction of from 24 to 30 *per cent.!* So far, at last, has Patient Practice got the lead of that dissembling opponent Theoretical Speculation.——21*st February.*

Quarterly Report for the Stewartry of Kirkcudbright.

The period which preceded the quarter under our review will long be memorable in the annals of agriculture, and registers of meteorology. So long a tract of rainy weather has not occurred, perhaps, for nearly a century. With the exception of three short intervals, the weather had been uniformly moist; the rains were frequently copious and long continued; and, towards the close of that period, descended in such torrents, accompanied with storms of wind, thunder and lightning, as bore a strong similarity to the rainy seasons which periodically occur in the East and West Indies. About the middle of December, the weather became more serene; the frost set in before the end of the month, and continued, with short intermissions, till near the end of January; but, during the whole period, it was so moderate as scarcely to suspend vegetation, and in very favourable situations, gave but little interruption to the operations of

the plough. Whilst the curlers were contending on the frozen lake, the circumjacent fields retained the verdure of spring; and the industrious ploughman, at no great distance, was whistling after his team. Ploughing was, however, generally interrupted for five weeks by the frost; but this period was highly favourable to all the other operations of husbandry, and the best in the whole season for the numerous flocks in the district, and for such cattle as are wintered in the fields.

After this interval of mild agreeable weather, a thaw commenced, and was soon followed by heavy rains and stormy winds. The whole month of February was gloomy, unsettled, and by no means propitious to the labours of husbandry. The sun seldom shone; the sky lowered; the atmosphere was surcharged with moisture, and the earth deluged with rains. If a serene day or a frosty night occurred, it was only to be regarded as a prelude to approaching storms. The fields have been, and still are, so drenched with moisture, that the cultivation of wet lands is totally impracticable; and even the driest and lightest soils, with the best exposure, will not for some time be in a condition for receiving the seed, though the weather should clear up. Of this we perceive probable indications, from the wind shifting to the east. If it settles in that point, which often happens in the spring months after a rainy winter, a course of dry weather may be expected.

From what has been stated, it will be obvious, that on all strong, clayey, and level lands, tillage must be unusually backward. These, however, form but a very small portion of the arable part of this district. On most of farms, if a favourable change soon takes place, the spring labours may be accomplished in their proper season; but all the early ploughed lands have been so much washed by the rains, as not to augur well for the ensuing crop. The failure of crop, particularly of barley and potatoe oats, which occurred last season, even on the finest and driest soils, may, we apprehend, be chiefly ascribed to this cause. The whole summer was remarkable for vegetation. Yet, the barley was not only thin, but so short, that on such lands it was actually in many instances overtopped by the clover. The clover plant strikes its roots deep into the earth, and would reach the fine mould and manure washed down; but barley, and other species of grain, whose roots reach to no great depth, would suffer from the same cause by which the clover was benefited. This may suggest the propriety of ploughing down the seed on such lands, after a rainy season, which, with respect to barley and wheat, we know to be a *safe* practice in any season. If ploughed with a narrow furrow, though of the ordinary depth, they will braird as soon, and more regularly, than when sown in the common way.

Grain of all sorts has been sufficiently in demand, and the prices less fluctuating than usual. Wheat, from 9s. to 10s. 6d.; Barley, from 4s. 9d. to 5s. 6d.; Potatoe oats from 3s. 6d. to 3s. 10d.; Common ditto, from 3s. 2d. to 3s. 6d. per Winchester bushel. In the two last articles a small advance has been lately experienced, owing to the demand for seed, of which this district can furnish good sam-

ples; as the grain was mostly harvested in excellent order. Little more, however, now remains, than what will be necessary for home consumption. Oatmeal has been sold uniformly at 3s. per stone of 16 lib. Troy, for four months past. Viewing the price in connexion with the produce, it will appear that the farmer has had a fair return for his labours; which for two or three years past had not been the case. But it will also appear, that the prices of grain in this and the two adjoining counties, are much below the average of other counties in the kingdom. Better regulations respecting the distilleries, and amendments on the corn laws, might perhaps remedy this, and obviate some other evils.

Notwithstanding the unfavourableness of the season, wheat has been sown to a greater extent than in any former year, and has generally a promising appearance, though, in many spots, the seed is thrown up, or washed out, by the alternate rains and frosts. The best preventive we know for this, is to plough down the seed.

From the abundance of vegetation, both sheep and cattle continue in good condition; and, though white crops were not bulky, yet as the crops of hay much exceeded the average, no scarcity of fodder is likely to occur. Cattle are sufficiently in demand; and support the former high prices, with a fair allowance for *wintering*. Butcher meat is from 7d. to 8d. per lib. *avoirdupois*: Pork, from the unusual quantity brought to market, has been always low priced; never exceeding 6s. or 6s. 6d. per stone *avoirdupois*.

As far as can be ascertained, it appears that the produce of last year (with the exception of barley) has not fallen much short of an average crop: And it seems probable that the present prices will be maintained, and that some advance will be experienced, if the extreme wet weather has been general through the kingdom, and shall continue much longer.——1*st March*.

Lanarkshire Quarterly Report.

The weather, during the winter that has lately terminated, has, like that of the summer and harvest which preceded it, been mild and moist compared with the generality of those we have seen. The frost has been sometimes severe for a few days, but of short duration; and though the ground has at different times been covered with snow, it has been but shallow, and soon melted. The few stormy days we have had were succeeded by others uncommonly mild for the season of the year. As a proof of the weather having been more than ordinarily temperate during winter, a hawthorn was found in full flower, on the last week of December, at Netherfield-dyke, in the parish of Avondale, probably in 450 or 500 feet of altitude above the level of the sea; where the soil is a cold clay, very imperfectly cultivated, and no way sheltered by plantations.

The early sown wheats have a promising appearance; and some of those that were late sown look better than could be expected, considering the state of the ground when sown.

The mildness of the winter has been favourable to live stock, and saved the fodder; a fortunate circumstance, as it was far from being abundant. The moor sheep, though injured by the continued damp

weather, have come to this period in better plight than ordinary; and, as they never fared better than they did last year, they were probably not often in a better condition than at present, in the end of February. From the long continuance of mild weather, it would be no way surprizing though some severe blasts awaited them during the remaining part of the spring.

The state of the markets in this county is every way similar to what they are in other parts of Scotland. Provisions of every kind are found in abundance. The price of butter has advanced considerably in the course of this month; and cheese seems also to start. Potatoes have turned out a better crop, and are still more abundant than was expected. —— *26th February.*

Letter from a Farmer near Langholm, 24th February.

'The winter quarter has been generally mild, or rather inclining to an excess of moisture. Some severe nights of frost have intervened, but of no long continuance. We had a pretty heavy fall of snow about the 4th of January; but it lay only a few days on the ground. Since that period, the weather has been moist and open; and few days have elapsed without less or more rain.

'The extreme moisture of the weather has retarded the operations of the husbandman; and field-work, in general, is not so far advanced as usual at this period of the season. The pastures, at present, exhibit a fuller vegetation in green herbage than we commonly witness at this time of the year. The stocks upon the sheep farms, however, are not in such good condition, or in such a thriving state, as the general mildness of the season might have led us to expect. An excess of moisture is highly injurious to the constitution and health of that animal.

'Our grain markets have been rather on the rising hand throughout the winter quarter; and it is highly probable, that, during the spring and summer months, they will be still higher. Butcher meat has been rather a scarce article here for some time past, the demand for lean stock last season having carried the greatest part of those intended for feeding to the South. Pork is as low as 5s. 6d. per stone in our markets; a price which cannot repay the feeder for his labour and expense in rearing these animals. Hay is plentiful, and the price, in consequence, moderate. Horses fit for farm labour are in great demand, and bring high prices.

A few days ago, I travelled across the country, through the lower part of Annandale, into Nithsdale, by Dumfries, and returned through the upper parts of these districts. The effects of the wet season are perceptible through the whole route I took. On rich, mellow, dry soils, the wheat crop has generally a healthy appearance; but on cold, high-lying, thin soils, with a wet subsoil, this crop has a very different look. In most places, it was too late in the season before it could be got sown, from the constant wet weather then prevailing.

It would appear that land rent at present is not continuing to rise as it has done for some years past; or that it is rather now at a stand, and may probably take a retrograde direction for some time.

as the produce which the farmer brings to market, and from which he has to pay his rent, seems at present to be in a sinking direction.'

East Lothian Quarterly Report.

THROUGHOUT the whole of last quarter, the weather has been singularly temperate for this northern climate, as scarcely a single day has occurred that both men and horses might not have been profitably employed in the ordinary labours of the field. During the few days of December and January, when the frost was sufficiently hard for carrying the carts and horses, the time was actively employed in clearing out the straw yards, or in leading out earth and compost middens; yet eight or ten days more of frosty weather would have been necessary to have enabled several farmers to have completed that desireable business. The ploughing of stubbles for beans and summer fallow, was completed in good time; and the last month has been favourable for the ploughing of clover lea for oats; which operation is now nearly finished in every part of the county; but a few frosty mornings would be of advantage in facilitating the harrowing process. Near the end of January, and also in February, several fields were sown with wheat, after both clover and turnip, which wrought in the most satisfactory manner; but nothing has as yet been done in the sowing of either oats, beans, or peas. In few instances has the ground been sufficiently dry for that purpose; but, except upon very rich soils, where danger is to be apprehended from a too luxuriant growth, the generality of farmers prefer waiting till the present month for the commencement of that important process, as after early sowing, there is generally a deficiency of straw, although the grain may be equally fine and abundant. Turnip stock have thriven much to the satisfaction of the feeder during the winter; and in general have left a moderate profit for the trouble and expense of the farmer. Highland wedders, which cost when laid upon turnip from 24s. to 26s. a-head, have sold at from 34s. to 36s.; and the returns from black cattle may be considered as something in proportion. There is still a fair proportion of the stock on hand; but, as the turnip crop has sustained no injury from the weather, no fears are entertained of a scarcity of food, until the whole can be fairly disposed of. The stack-yards appear rather thinner than usually happens at this season, although enough of fodder still remains to supply the cattle until the grass season arrives: Perhaps this, in some measure, may be in consequence of the defectiveness of the wheat and barley crops, as, in many cases, it has been found necessary to thrash three stooks of grain to raise the same money that would have been drawn from two in ordinary seasons, when prices were far below what they have been during the last winter.

The early sown wheats are very thick upon the ground; and most of the fields sown in November are well planted and promising; while the young grasses, in general, continue to show a prospect equally flattering as at the conclusion of harvest.

Markets for grain have been well supplied throughout the winter; during which, prices, although fluctuating, have in general been high. When it was resolved to stop distillation from grain, the price of fine barley dropped considerably, while inferior samples were hardly saleable

at any price. Fortunately, little of this latter ſort remained on hand; but, had the ſtoppage taken place a few weeks ſooner, a ſevere loſs would have been ſuſtained by many individuals, as a very conſiderable quantity of damaged grain was converted into ſpirits, which otherwiſe was totally unfit for the food of man, and for which it would have been impoſſible to have found any other market, the feeding of cattle excepted. In Haddington market, on Friday the 28th ultimo, the beſt prices were—Wheat for ſeed 55s.; fine Barley for malting 40s.; Oats 28s.; and Beans 30s.; all per boll Linlithgow meaſure. Hay has ſold at from 10d. to 12d. per ſtone, and Potatoes at about 12s. per boll: But the demand for both of theſe articles is very limited; and ſales of courſe heavy.——*March* 3.

Mid-Lothian Quarterly Report.

The winter throughout has been variable, but mild, having no ſevere froſts of long duration. So much has this been the caſe, that good graſs land in condition has not loſt its autumnal verdure.

This circumſtance has been of utility to ſtock farms in the high diſtricts, by allowing both cattle and ſheep the full range of the fields; and thus ſaving provender, an article originally rather ſcarce.

These changes of froſt and freſh have alſo allowed ploughing to be well advanced, particularly on lea lands; while the carting of dung has been carried on in the intervals unfit for ploughing: Hence, as ſoon as ſteady dry weather commences, theſe operations will be no bar to the ſowing of the crop. It is, however, to be dreaded that winter is not yet over, but may make its appearance at a more advanced period of the ſeaſon, when the ſun is high, and of courſe more deſtructive to vegetation than when the days are ſhort.

The ſame reaſons have allowed full benefit to be derived from the turnip crop.

The butcher market has been well ſupplied, and is likely to continue ſo for a conſiderable time, as the diſtillery cattle are hardly well begun to. This is a circumſtance of conſiderable advantage to the community, although little adverted to by thoſe who are inimical to diſtillation from grain.

Towards the end of laſt month, wheat has been ſown in different inſtances, both of the winter and ſummer ſpecies. The drilling of beans has commenced, and even ſome barley has been ſown, which is earlier than uſually attempted in this county.

The corn markets have been pretty ſteady, and the crops have turned out nearly as ſtated in laſt report, wheat being found uniformly deficient. Graſs parks have fallen about 10 per cent. below former years.——*March* 2.

Weſt Lothian Quarterly Report.

The laſt quarter, as to weather, has been, upon the whole, remarkably open; the froſt never ſevere, ſeldom two inches deep, and ſcarcely more than the ſame depth of ſnow, which ſeldom remained three or four days upon the ground. The turnip of every variety freſh and nutritious; ploughing forward; but the lands being

still wet from the recent heavy rains, no seed can be put into the ground for some days yet, even though the weather should continue dry.

Markets have remained tolerably steady, and are now beginning to look up, as is usual towards seed-time. The sprouted wheat, occasioned by the wet harvest, has been a drug in farmers' hands, the bakers affording little more than half price for it. The oats, although in many farms they suffered by the above cause, have, however, turned out an average crop. Barley far short, both in quantity and quality, of an average crop. The beans and peas, on the soils adapted to their growth, were nearly an average, but suffered much by sprouting. The fodder, upon the whole, being greatly damaged by the rains, has rendered it less nutritive than usual, and is of course getting thin in the barnyards.

Prices of wheat, per Linlithgow boll, (a little more than 4 Winchester bushels), are from 40s. to 52s.; Oats, from 22s. to 28s.; and Barley, from 31s. to 36s.; per boll of 6 Winchester bushels; Beans and Peas from 28s. to 36s. same measure as the wheat; all according to quality. Oatmeal from 18d. to 20d. per peck of 8 lib. Dutch; Potatoes 1s. per peck of 24 lib. Dutch.

Fat cattle and mutton markets have remained much the same all winter. Prices of beef and mutton from 6d. to 8d. per lib. Dutch; the demand for pork has been very limited: The potatoes being reckoned high priced, as also the barley dust, the common people are prevented from feeding them so numerously as in plentiful seasons; and the supply of other butcher meat being steady and uniform, occasions less demand for them among the country fleshers.——*7th March.*

Perthshire Quarterly Report.

The weather during the last three months, though very variable, has on the whole been favourable to the farmer. The frost during the winter was at times very severe, but always of short duration; so that the quarter may be characterized as open, or even rainy. Though the autumnal rains for a time retarded field operations, labour is now pretty well advanced. The fallow, excepting where the ground was naturally wet, was ploughed the first time in tolerably good order, and the seed-furrow for oats is going on briskly. The young wheat is looking as well as can be expected; perhaps better, considering the late period at which a great deal of it was sown. Late sowing is certainly to be avoided, if possible; though, in the present instance, if the spring continue as mild as this month has been, there will be very little cause for regretting that circumstance. The thermometer since the beginning of February has often stood above 40 at nine o'clock in the evening, and more than once at 46.

It was stated generally in a former report, that last wheat crop would be deficient in quantity. It is now found that it is nearly one-fourth, and in many instances one-third, short of a fair crop. The deficiency in the barley is still greater; of the oats not so much. It is probable that few expected the wheat would turn out an average crop; but still fewer dreaded the deficiency would be

so great. This circumstance is sufficient to account for the steady price which it has maintained during the whole season. Barley, too, notwithstanding the distillation act, continues to bring a very fair price. It experienced indeed a depression when the prohibition measure was carried into effect, but it soon rose again to its former level—a certain proof of a very great deficiency.

It is always difficult to fix, with any tolerable degree of accuracy, the average price of a corn market, where a register of the quantity sold is not kept. The highest and lowest prices, according to the present state of the markets in this quarter, are as follow. Wheat 40s. to 52s.; Barley 25s. to 33s.; Oats 20s. to 25s.; Peas and beans 24s. to 25s.; Oatmeal 24s. to 26s. The average price, however, will exceed the medium of these extremes.

Whatever grounds of complaint the farmer may have from other causes, he has none on the score of markets. Perhaps the most sanguine never entertained expectations so high on that subject, as have been realized during the last four months. Unfortunately, however, the high price of grain is not always a proof that the grower is indemnified for his expense in raising it; and there is reason to fear that the remark has this season been verified. It is too evident that the high price is temporary, owing to the limited supply; and to the generality of farmers, the advantages which they might otherwise draw from such a price, are more than counterbalanced by the *small* quantity they have to dispose of. There is little reason to expect, therefore, that the present favourable state of the grain market will be sufficient to counteract the effects of that check which the spirit of farming has sustained within the last two years. That such a check has been received, is too obvious to be concealed; the very limited demand for farms, independent of every other circumstance, being incontrovertible evidence of this distressing truth. A still more melancholy proof, however, of the same thing, is the comparatively small quantity of lime that has been applied in several districts during the last season. It is painful, and by some may be reckoned injurious, to record such facts; but no opportunity should be omitted of endeavouring to place the state of the country in its true light—of discovering how far the present evils may or may not be remedied; and of pointing out the line of conduct that farmers ought to pursue. A concurrence of circumstances has driven from the field a number of speculators, who had embarked in undertakings in which they never could succeed, because they were destitute of both the capital and talents necessary for that purpose. The shock which the agricultural world has received by the failure of such men, is indeed alarming. The farmer, however, ought to be told, that the depression which followed this shock is just as unnatural, as the preceding elevation had been—that things are again gradually approaching, and will continue to approach their former state—and that though their progress may be less rapid, it will be more solid and lasting. But, at the same time, it ought to be observed, that this desirable object can only be attained by unremitting exertion and unwearied perse-

verance on the part of those who have been able to weather the storm—and that despondency will only increase the evil, and plunge them deeper in those difficulties with which they are already surrounded.——*26th February.*

Ross-shire Quarterly Report.

It was not until the latter end of November, when the weather became more settled, that the wheat intended to be sown before winter was got finished, and the operations then were only executed, even on the driest lands, as the work of imperious necessity; the land by no means being in that state of dryness which could be wished; and several fields were so completely drenched as to render it impossible to get them sown, to the no small loss of the farmers, after incurring the expense of a fallow and lime. Throughout December, and until the last week of January, the weather was extremely variable and tempestuous; the frost, however, was seldom intense, nor had we ever a deep storm of snow. The fields of wheat sown in the latter end of November have been brairding within the last three weeks, and come up thin, which may be attributed to the wet state of the land, destruction by crows, and having to vegetate in the depth of winter. All the fields sown in October look remarkably well, possessing a full stock of healthy plants. The weather having continued good during this month, part of the turnip fields which have been cleared of that crop have been sown with wheat in good condition; and, as the disposition to increase the culture of that grain predominates with all the modern farmers, it is likely a considerable breadth more will be sown, if practicable, within the next fourteen days. It is not supposed the quantity of wheat produced in Ross-shire ten years ago exceeded two thousand bolls; if the crop now sown yield equally well as several preceding ones, the produce will not likely be overrated at ten thousand bolls. Even this must appear a trifling quantity compared with southern counties, and is so, compared with the capability of Ross-shire; but when it is considered, that many of the principal farms are only in an infant state of improvement, and still a great part of the county at the old trade of bear and oats as their staple, it is evident, that some of the landlords and farmers are following an enlightened system of husbandry.

With sincere pleasure we observe, that the proprietors of the beautiful valley of Strathpeffer are advertising for a contractor to execute a large drain through that strath, which is much wanted, and has hitherto kept an extent of valuable land in a state of nature, forming a blot in the most garden-like spot of Ross-shire. We anticipate the pleasure of beholding, in a short time, a complete improvement of this tract.

Ploughing is well advanced, and some of the driest lands preparing for beans, the culture of which is also becoming more extended; the experience of several years having shown, that the climate may be depended on for ripening that grain as early as in the south of Scotland, when the lands are in high condition. Corn markets have been languid for some time back, and prices rather nominal than otherways: Wheat may be stated at 42s. to 48s. per Linlithgow

boll; Barley from 32s. to 35s.; Potatoe oats 28s. to 32s. per five firlots; Common ditto 25s. per ditto; Oatmeal 28s. to 30s. per nine Dutch stones.

Turnips have not suffered by rot; and, from the openness of the winter, stock have done well on them. The number of good stots wintered on straw, turnips, and hay, increases; these are principally exposed for sale at John's fair, in the eastern district, about the middle of May, at which time also happens the Crofterunie market, in the Black Isle district, from whence the cattle are driven to Dumbarton. The rent of land advances, though there is not a brisk demand for farms.——*26th February.*

Tweeddale Quarterly Report.

SELDOM have we seen in this county a winter with less snow; and though we have had some very high winds, with rain, yet sheep (the staple commodity of the county) are in excellent condition, and prices are expected to rise.

Turnips have remained quite fresh through the winter, and, consequently, have afforded more nourishment to the feeding stock than is generally obtained from them. Good fat has sold well; and prices have been pretty steady through the season, especially of cattle, a considerable number of which are still on hand; but fat sheep are mostly sold.

The crop, though deficient in bulk, has turned out well both in the barn and at the mill; and, though a scarcity of fodder was apprehended, yet the winter has been very favourable for cattle going out through the day and saving it. And the stack-yards, though not bulky, bid fair to hold out till the return of grass, if the spring is not very severe. Hay, though but a light crop, still continues low in price, about 9d. and 10d. per stone; a great part of the county being too distant from Edinburgh to drive it there, and very little is consumed at Peebles. Our fiars were struck on Tuesday last. Oatmeal, per boll, 22s. 11¼d., 22s. 2d., 21s. 6d.: Wheat, per boll, 51s., 45s., 37s.: Barley, 35s. ½d., 31s. 10d., 29s. 6d.: Bear, or big, 31s., 30s., 26s. 9d.: Oats, 23s. 3d., 19s., 18s. 1½d.: Peas, 26s. But as the prices are only taken, and not the quantities, the average must partly be guessed. Prices of oatmeal at Peebles, on Tuesday last, 24s. 6d. and 24s. per boll. As the crop will be sooner thrashed out than usual, it is expected that prices will be high through the summer, especially if we shall have war with America.

The culture of wheat, which was introduced in small quantities a number of years since into the southern part of the county, on the banks of the Tweed, is now getting a little higher up, along the banks of some of its tributary streams, and in larger quantities than formerly. What was sown in September is looking very well; but what was sown in November is very faint, the ground about that period having been completely drenched with rain.

The ploughing is nearly finished for oats, except upon some fields that are not yet cleared of turnips.——*2d March.*

Wigtonshire Quarterly Report.

DURING a considerable part of the winter, the weather has been unusually mild and open; dry also, and pleasant. From the excessive rains

of autumn, however, a large proportion of the ground intended for wheat was not feeded at the moſt deſirable time, and it is only now that this operation is drawing to a cloſe.

The quality of laſt crop turns out, as apprehended, in a great degree defective; but prices are good. Ploughing is well advanced; and, with the advantage of a good feed-time, the corn farmer will feel himſelf tolerably ſituated.

For live ſtock there is every proſpect of a great demand. The cattle market appears to have continued open during the winter; and very conſiderable ſales have been made of late. The event in this caſe likely to be apprehended is, that prices may be forced beyond the proper level, which is ſure to produce miſchief and diſorder in the end.

The rent of land has not riſen for ſome time; and the price of labour ſeems to remain ſtationary.——*26th February.*

ENGLAND.

Cumberland Quarterly Report.

During a conſiderable part of the laſt two months, the labours of the farmer have been much impeded by inclement weather. Many years have elapſed, ſince ſtorms have been ſo inceſſant. In many inſtances, the roads are almoſt impaſſable. All heavy ſoils are in a ſtate which precludes ploughing. Wheat in general promiſes well; and little doubt need be entertained of a good crop, if its progreſs be not retarded by ſevere froſts in the ſpring, or other cauſes wholly independent on the wiſdom and induſtry of the agriculturiſt. Mr Curwen's wheat ſown on clover lea, promiſes to be very indifferent, though he has this year increaſed the quantity of ſeed per acre; a want of which, he conceived (Rep. p. 265), was the cauſe of his former failures. His moſt promiſing crop was manured and limed. His fallow wheat is very good. When it is conſidered, that almoſt all the trials made in the north of England, and Scotland, to prove the propriety and utility of ſowing wheat on clovers, have failed; ſurely prudence,—a juſt regard to our own intereſt, and that of our country,—require the total renunciation of a ſyſtem which facts ſo invariably oppoſe. Thus far Mr Curwen has ſhown much candour in owning his errors, conſcious a wiſe man ought to be wiſer to-day than he was yeſterday; and I truſt the ſame candour will lead him to prove to this county, that the ſoils with which he has to contend require a very different rotation from the Norfolk one. No farmer, however active—however intelligent—can always ſay, My management has thus far been invariably correct. Every year is adding to the ſtock of his information; and experience, his beſt inſtructor, is diſregarded only by ignorance, raſhneſs, pertinacity, or folly.—Mr Curwen's ſtock of milch cows are in excellent condition, and continue to anſwer all objections againſt ſoiling. Every unprejudiced mind muſt be convinced, that the ſhort-horned breed are very much ſuperior to the long-horned, by inſpecting Mr Curwen's ſtock, and comparing them with the long-horned ſtocks which are ſoiled in the ſame manner. The ſhort-horned breed of cattle is rapidly extending; and in a ſhort period, I truſt, they will wholly ſupersede the long-

horned.—A careful perusal of Mr Curwen's Report, must induce all our reflecting landed proprietors, to adopt a system in direct opposition to that of Rack-Rents and Short Leases, or, it may be, no leases at all. When they find Mr Curwen complaining, year after year, of successive failures in his crops—one who has so extensive a command of capital, of labour, of manure—must they not be convinced, that still greater failures await men of small capital, whose situation frequently prevents a command either of labour or manure? May every landlord consider that, whatever paralyzes the exertions of our farmers, saps, at this eventful period, the very foundation of our existence and happiness as a state! Cherish your tenants; adopt, in the setting of your farms, a mode of conduct at once liberal and enlightened; and rest assured, Napoleon, with all his minions—all his armies, shall plan our ruin in vain. Ye statesmen, whether *in* or *out* of office, direct your attention to the state of agriculture amongst us. There are many *impediments* to its progress, which you *alone* can remove; and without a removal of which, this nation must still continue to be a century behind the *best improved* districts in our SISTER KINGDOM.—It must demand great exertion to accomplish the various labours required in spring. I am inclined to think, that the produce of wheat per acre, in a very considerable part of this county, is not more than 21 Winchester bushels. Barley is a very defective crop. Oats the most abundant. Cattle and horses bring great prices. Wheat 11s. 4d. per Winchester bushel. Oats 3s. 10d. Barley 5s. 4d. Potatoes 6d. per stone.—*Feb.* 27.

Extract of a Letter from Wales, Feb. 20.

'We have hitherto had one of the finest winters ever remembered; not a day's hinderance by either froft, fnow, or rain, till laft Friday; when we had a heavy fall of rain, and high wind. Of courfe, field work is forward; and where farmers were unable, on the wet clays, to finifh fowing their wheat in the autumn, from the long continuance of rain at that time, the fine dry month of January enabled them to complete the whole, which is now green, and looking well. The early fown wheats are looking as they ought to do in April; and although many fields that were fown, when too wet, are in patches, on the whole the appearance at prefent is good, which we hope will continue, and bring on an early harveft; for by all appearances at prefent it will be much wanted. The laft crop has turned out worfe than expected at harveft, for grain of all forts. All the ftackyards are already nearly empty, and things look as bad as they did at this time in the year 1800; yet prices keep fteady, and the alarm does not feem to be fo great as might be expected. Beft Wheat 40s. and 42s. for 168 pounds; or, if by meafure, 21 gallons. Barley from 20s. to 22s. for 21 gallons. Peas and Beans nearly the fame as Barley. Oats from 14s. to 18s. for 33 gallons. Potatoe Oats, to oatmeal-makers, has been as high as 20s. Potatoes have fold well during the winter; and the Turnips have continued to grow through the whole of it, and are now running fait to feed, having had no froft to check them. We were fortunate laft year in having good crops of hay, otherwife fodder muft have been very fcarce, as moft of the ftraw is gone. At our late fairs, cattle,

horſes, and ſheep, have all ſold well, there being a demand from the eaſt. Butcher Meat has kept at a moderate price through the winter, particularly mutton. Owing to the number of rotten ſheep in the country, the markets have been filled with poor meat, many having been obliged to kill off their whole flock. We have had a fine favourable time for the ewes dropping their lambs, which are doing well. Pigs, which have been at a low price ever ſince harveſt, have now taken a ſtart, and ſell at a fair price. The preſent prices of grain, I apprehend, have prevented breeding them.—Rent of land is ſtill advancing, although there is a general complaint amongſt the farmers that it cannot be paid. Every place is taken at an advance, as ſoon as it comes into the market.'

Yorkshire Quarterly Report.

From the general mildneſs of the weather hitherto, during the preſent winter, forage of all kinds (except turnips in theſe diſtricts), is plentiful, and much cheaper than in ſeveral preceding ſeaſons. Of courſe, ſuch ſheep and cattle, as are in a ſtate fit for fattening, will be very fairly brought forward, till the re-appearance of graſs. Indeed, in regard to ſheep ſtock, the ſeaſon, which has ſpared the food, has been deſtructive to the animals. For want of dry froſty weather at the beginning of winter, the loſs by the rot, &c. is likely to be more ſerious than has been experienced for ſome years paſt. Lean cattle are ſelling very well; and fat ſtock is expected to be very dear, as fewer even of that ſort are coming forward than uſual. The beſt hay is about 5l. per ton. Beſt Beef 9d.; Veal 9½d.; Mutton and Pork 8½d. Butter 1s. 6d. per lib. avoirdupois.

The common turnip, both drilled and broadcaſt, prove of no value whatever, in the beſt parts of the Weſt Riding of this county; conſequently, the great value of the Swediſh ſort is more than ever felt; yet even that moſt hardy ſpecies has ſuffered a partial decay.

Moſt of the growing wheats are uncommonly flouriſhing in their appearance; on good ſoils, under good cultivation, they are perhaps much too luxuriant. The graſs and clover ſeeds are very fine.

Horſes of good appearance and uſefulneſs continue ſcarce and dear. Pigs of all ſorts are ſelling at better prices than at the beginning of winter, when they were of little comparative value.

The wool trade is very flat, as are likewiſe moſt other branches of buſineſs. Indeed, the number of people unemployed or ill employed, in moſt of the manufacturing towns and diſtricts, is alarming beyond all former precedent. This is an increaſing evil, loudly calling for redreſs, on the feelings and conſcience of every one in the ſuperior ſtations;—an evil, demanding a policy and management much more ſubſtantial and effective, than appear ever to have been in the contemplation of the politicians of modern times; who, however anxious for power and fame, evince but little ſolicitude for a ſtarving population at home.

There is a failure on the thraſhing floor, more or leſs, in every ſpecies of grain of laſt year's growth. The markets appear advancing everywhere.

The beſt wheat 14s.; Barley 8s.; Oats 5s.; Rye 8s.; and Beans 7s. 6d. per buſhel of Wincheſter.——*Feb. 24th.*

NOTICES

NOTICES TO CORRESPONDENTS.

If the writers of the two papers from Dumbartonshire, signed *B. A.* and *Mechanicus*, will favour the Publishers with their address, they shall be informed of the reasons which prevented the insertion of their communications in the present Number.

We are sorry that the letter from the respectable Reporter for Northumberland did not reach us a few days sooner. That gentleman may be assured that his desire shall be punctually complied with in future.

Several communications have been lately received, to which due attention shall be paid. We must be excused for remarking, that though this work shall at all times be open to temperate discussion, on every subject connected with the interests of Agriculture, it shall never be prostituted by the admission of violent declamation and personal abuse.

It is intended to present, in next Number, a Portrait and Memoir of the late worthy and much lamented Duke of BUCCLEUCH and QUEENSBERRY. The character and conduct of this justly respected nobleman, *as a proprietor*, ought to be known in every quarter, and imitated, as far as circumstances will permit, by every great landlord of the United Kingdom. The occupiers of his extensive estates have long venerated his name as that of a benefactor and a friend; and many families, now in ease and affluence, have to acknowledge, that, but for the benevolence of his Grace, and had they experienced the harsh treatment which they too often saw exercised towards the tenantry around them, they must long ago have fallen victims to poverty and despair.—It was much wished that the materials necessary for this purpose could have been obtained for the present Number; but this was impracticable.—It is earnestly requested that communications on this subject may be transmitted at an early period.

No. L. will be published on Monday the 8th of June.

ERRATA.

The two following omissions, which we beg our readers to supply, escaped notice in the proper places.

p. 69. line 5th from the bottom, for 'fourteen Winchester bushels,' read 'fourteen bolls or 56 Winchester bushels;' and,

p. 71. line 11th from the bottom, for '50 bushels,' read '50 bolls or 200 bushels.'

D. Willison, printer,
Edinburgh.